



An
Edo
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Initiative

Measuring the Continued Progress of the EdoBEST Programme in Junior Secondary Schools

Evidence from government Junior Secondary Schools (JSS) in Edo State by the end of the 2023-24 school year after over 2 years of the EdoBEST programme

Sylvester Mchihi, Daniel Rodriguez-Segura, Keuna Cho, Priscilla Lu, Marlee Mullane, Savannah Tierney, and Anchal Khandelwal





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July 2025

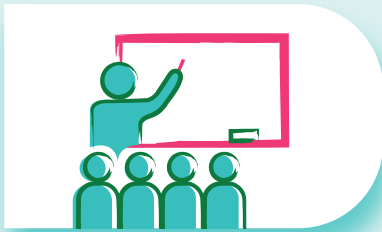
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Executive Summary

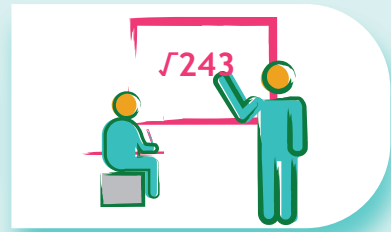


After an initial 14-week launch period during which no measurable improvements were observed, student learning outcomes improved substantially in the following two years.



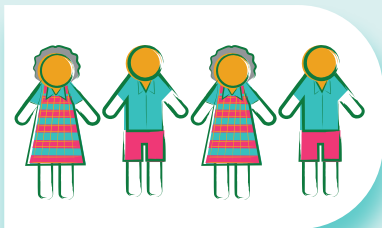
English literacy outcomes have greatly improved in JSS schools, with average reading fluency and comprehension rates increasing by over 30% across JSS 1-2.

Since July 2022, the share of non-readers in EdoBEST JSS schools has been reduced by half, now standing at just 5%. The average JSS 1 student can read 89 cwpm, and the average JSS 2 student scores 44% in grade-level reading comprehension.

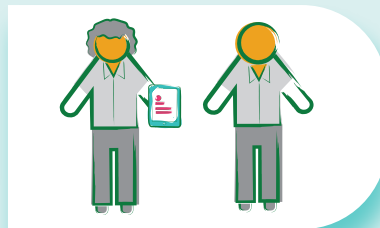


Maths outcomes have substantially improved since July 2022, with current JSS 1 students performing more than a full grade level ahead of where they would be without the EdoBEST programme.

Over the last two years, average scores on division problems involving remainders (e.g. $93 \div 7$) increased by more than 50% (13 percentage points) in JSS 1. Additionally, 25% more JSS 1 students can solve multiplication problems requiring regrouping (e.g. 42×6) compared to JSS 2 students two years ago.

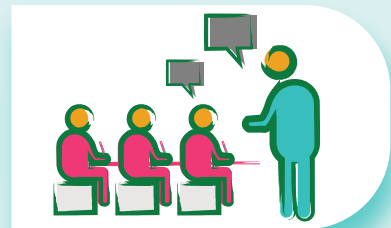


The programme maintained gender parity, with boys and girls demonstrating similar learning gains.



Average teacher attendance rates have doubled since the programme's launch.

In the first full term of the EdoBEST JSS (Term 2 of the 2021-22 school year), teacher attendance rates averaged 43%. Throughout the following school year, it increased to 76%, on average. This year, teacher attendance rates remained consistently high – hovering around 90% – thereby maximising the amount of instruction teachers are able to provide to their students.



Student attendance and lesson completion rates remained consistent throughout the year, although there is room for improvement in both areas.

Throughout the school year, both student attendance and lesson completion rates averaged slightly over 60%. While consistent, these rates are relatively low, and present an opportunity to strengthen the programme.



2 Years of Programme Implementation, In Numbers:

50% reduction in non-readers in JSS schools now compared to 2022.

22 more words read correctly in a minute by the average JSS 1-2 student.

30% increase in reading comprehension scores from 19 to 25 percentage points.

12% increase in average ICAN scores since EdoBEST JSS was implemented.

80%+ teacher attendance rates throughout the 2023-24 school year.

Report Glossary

Key Terms

absenteeism	When a pupil or teacher fails to report for or remain at school as scheduled, regardless of reason.
automatic decoding	The ability to rapidly, effortlessly and accurately recognise a written word upon seeing it (Pikulski & Chard, 2005).
baseline	The conditions existing prior to an intervention or at the beginning of a period of time, against which changes can be measured, monitored, and evaluated (OECD, 2022).
benchmark	A reference point or standard against which outcomes can be assessed, established based on comparable data, or what can be reasonably inferred to have been achieved under a similar set of circumstances (OECD, 2022).
chronic absenteeism	<p>When a pupil repeatedly fails to report for or remain at school as scheduled, leading to a significant negative impact on academic performance relative to their peers.</p> <p>The threshold for “chronic” absenteeism is not always clearly defined. In some high-income countries such as the US, a pupil is deemed to be ‘chronically absent’ when they miss 10% or more of the school year (Lara et al., 2018). However, this definition does not necessarily extend to other systems. Given that attendance rates and expectations are highly context dependent, working definitions for what classifies as chronic absenteeism should be determined on a case-by-case basis.</p>
cohort	A group of pupils who are in the same grade and attend a school implementing the EdoBEST programme. (ex. All Primary 2 pupils attending all EdoBEST Progressive schools in the 2023-24 school year.)
comparison group	A group of schools which do not receive the EdoBEST programme. These schools act as a point of comparison to schools which do receive the programme (labelled as the treatment group), so that the impact of the programme can be assessed.
correct words per minute 'cwpm'	A metric used to measure oral reading fluency by the number of words read correctly, out loud, from a given passage.
curriculum	A planned sequence of lessons, designed to foster pupils' proficiency in content and/or skills. A curriculum typically includes instructional content, activities, and processes for assessing learners' achievements (UNESCO, 2024). A curriculum may be developed at the national, state, or institutional level, with considerable overlap often occurring among these tiers; typically, broader curricula at the national or state level significantly influence the development of more localised educational programmes.
differentiation	The modification of instruction and curricula to better suit the learning levels and educational needs of pupils.
empirical (research/data)	Derived from observed evidence, rather than theory or anecdotal evidence.
enrolment	An individual's registration for an educational programme, public, private, or otherwise. The phrase "rate of enrolment" therefore refers to the proportion of a given population that is enrolled in an educational institution (UNESCO, 2011).
foundational learning	Basic literacy, numeracy, and transferable skills such as social-emotional skills which are required for more complex learning to take place (UNICEF, 2022).

foundational literacy	Key fundamental skills that are prerequisites for the ability to comprehend written text, including but not limited to: phonemic awareness, print orientation, oral fluency, etc.								
foundational numeracy	The ability to perform arithmetic operations and apply them to day-to-day life, including but not limited to: number recognition, addition, subtraction, multiplication, and division, as well as word problems involving these operations (World Bank, 2024; UNESCO, 2024).								
heterogeneity	<p>The state of being diverse in content, characterised by the presence of distinct and varied components.</p> <p>In the context of this report, the term heterogeneity or heterogenous is used to describe the extent to which dissimilar outcomes exist within a system. For example, if there is "a great deal of heterogeneity in Primary 3 fluency rates" that means that fluency rates vary widely among Primary 3 pupils. If there is high "heterogeneity by gender", this means that learning outcomes among boys and girls are very different from one another.</p> <p>Heterogeneity is determined relative to that of comparable data sets through standard deviations (National Center of Education Statistics, 2024).</p>								
high-income countries	This report uses the World Bank’s classification of high-income countries: “[Countries] with a gross national income per capita, calculated using the World Bank Atlas method, of \$13,846 or more in 2022” (World Bank, 2024).								
Junior Secondary School	A level of education that requires the completion of Primary education, and lays the foundation for lifelong learning and human development upon which education systems may then expand further educational opportunities. Programmes at this level are usually organised around a more subject-oriented curriculum, introducing theoretical concepts across a broad range of subjects (UNESCO, 2011).								
literacy	<p>Leading organisations in international education reform offer disparate definitions of literacy:</p> <table border="1" data-bbox="509 1261 1402 1635"> <thead> <tr> <th colspan="2">External Definitions of Literacy</th> </tr> </thead> <tbody> <tr> <td>World Bank/ UNICEF</td> <td>“[The ability to] both read and write with understanding a short simple statement about [an individual’s] everyday life” (UNICEF, 2022b).</td> </tr> <tr> <td>UNESCO/ PIAAC/OECD</td> <td>Literacy is the ability to identify, understand, interpret, create, communicate and compute, using printed and written materials associated with varying contexts (UNESCO, 2024).</td> </tr> <tr> <td>IALS & ALL</td> <td>Literacy is using printed and written information to function in society to achieve one’s goals and to develop one’s knowledge and potential (National Center for Education Statistics, 2003).</td> </tr> </tbody> </table> <p>Demonstrated by the wide variety of definitions above, literacy is incredibly complex and difficult to define. The goal of the EdoBEST programme for pupils is to be able to read and comprehend a grade-level passage, as determined by SUBEB. Unless otherwise noted, the EdoBEST programme aligns literacy expectations with the Hasbrouck Tindal norms.</p>	External Definitions of Literacy		World Bank/ UNICEF	“[The ability to] both read and write with understanding a short simple statement about [an individual’s] everyday life” (UNICEF, 2022b).	UNESCO/ PIAAC/OECD	Literacy is the ability to identify, understand, interpret, create, communicate and compute, using printed and written materials associated with varying contexts (UNESCO, 2024).	IALS & ALL	Literacy is using printed and written information to function in society to achieve one’s goals and to develop one’s knowledge and potential (National Center for Education Statistics, 2003).
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IALS & ALL	Literacy is using printed and written information to function in society to achieve one’s goals and to develop one’s knowledge and potential (National Center for Education Statistics, 2003).								
lesson completion	<p>Lessons are marked as completed if an educator teaches 80% or more of a scheduled lesson’s content within 80-120% of the allotted time.</p> <p>The rate of lesson completion is therefore the proportion of lessons a teacher, school, district, etc. completes out of all scheduled lessons in a given timeframe.</p>								
levelling	Setting of the difficulty of curricula and lesson content based on pupils’ learning levels and previous levelling decisions.								

low- and middle-income country/countries	This report uses the World Bank’s classifications of low- and middle-income countries: Countries with a gross national income per capita, calculated using the World Bank Atlas method, of \$13,846 or less in 2022 (World Bank, 2024).						
‘LMIC’							
median	The middle data point in a sequentially ordered data set, or the average of the two middle data points in the set. Ex. If the data set [2, 4, 7, 1, 2] is ordered sequentially, it becomes [1, 2, 2, 4, 7] the middle value being 2. The median of this data set is therefore 2.						
non-qualified teachers	Teachers who have not received formal training or education to meet regional standards (UNESCO, 2024).						
non-reader	A pupil who, when presented with a passage, is unable to correctly read a single word aloud within a minute.						
numeracy	Major organisations offer varying definitions of numeracy: <table border="1" data-bbox="517 741 1402 972"> <thead> <tr> <th colspan="2">External Definitions of Numeracy</th> </tr> </thead> <tbody> <tr> <td>World Bank</td> <td>The ability to make simple arithmetic calculations (World Bank, 2024a).</td> </tr> <tr> <td>UNESCO</td> <td>The capacity of a person to engage in all those activities in which numeracy is required for effective function of his or her group and community (UNESCO, 2024).</td> </tr> </tbody> </table> <p>Because this report refers to both numeracy and mathematics, it is important to note that researchers often distinguish numeracy from mathematics by associating numeracy with skills involving numbers which are commonly utilised in day-to-day life (as opposed to higher level mathematics such as calculus) to a greater extent than mathematics (Dion, 2014; Ginsburg et al., 2006; HRSDC & Statistics Canada, 2005; Karaali et al., 2016). This report uses the terms numeracy and mathematics synonymously.</p> <p>Given existing international definitions, the goal of the EdoBEST programme is for pupils to be proficient in grade-level mathematics skills, as determined by SUBEB.</p>	External Definitions of Numeracy		World Bank	The ability to make simple arithmetic calculations (World Bank, 2024a).	UNESCO	The capacity of a person to engage in all those activities in which numeracy is required for effective function of his or her group and community (UNESCO, 2024).
External Definitions of Numeracy							
World Bank	The ability to make simple arithmetic calculations (World Bank, 2024a).						
UNESCO	The capacity of a person to engage in all those activities in which numeracy is required for effective function of his or her group and community (UNESCO, 2024).						
oral reading fluency	The rate at which a pupil can read a written text aloud (measured in the number of correct words read aloud from a passage within a minute, or ‘cwpm’).						
phase	A portion of a programme’s duration, usually as part of an expansion plan as the programme is rolled out to more schools across a territory, when a group of schools implements the EdoBEST programme on the same timeline. For example, if a programme is rolled out through a country in two phases, one group of schools will participate during the first phase, then these schools will continue their participation during the second phase as a second group will begin their participation.						
phonemic awareness	The ability to understand that spoken words are made up of individual sounds or phonemes.						
phonics	The process of learning to read an alphabetic language by correlating letters or groups of letters with sounds.						
Primary education	A level of education that occurs after early childhood education and prior to JSS; it provides learning and educational activities typically designed to provide pupils with fundamental skills in literacy and numeracy, and establish a solid foundation for learning and understanding core areas of knowledge and personal development, with little, if any, specialisation (UNESCO, 2011).						
Primary-model schools	Schools (regardless of grade level) that use a traditional staffing model of one teacher per classroom with class-level groupings.						

Progressive-model schools	Schools (regardless of grade level) that have fewer than one teacher per grade-level and use a “multi-grade” teaching model, incorporating ability grouping across grades. Ex) For a portion of the school day, pupils are grouped by ability rather than by class level, and receive instruction targeted at their ability level. For the rest of the day, pupils from each class receive instruction on class-level concepts in accordance with their syllabus.
public-Primary school	A school that receives public funding and includes Primary grades. A public-Primary pupil is therefore a pupil who attends such a school.
reading comprehension	The ability to derive meaning from written words when they are part of a text (Hoover & Gough, 1990).
Senior Secondary School	A level of education that is typically designed to prepare pupils for tertiary education or provide skills relevant to employment, or both. Programmes at this level offer pupils more varied, specialised and in-depth instruction than programmes at Lower Secondary education (UNESCO, 2011).
standard deviation	A measure of how widely or narrowly scores are dispersed for a particular data set. Specifically, it is the square root of the average squared deviation of scores about their arithmetic mean (National Center of Education Statistics, 2024).
stratification	Sorting data into strata by one characteristic – such as geographic region – usually for the purpose of sampling or randomisation in a randomised controlled trial, such that each stratum is appropriately represented in the sample and/or to increase statistical power.
structured pedagogy	A comprehensive educational approach that enhances classroom instruction through a coordinated package, including detailed lesson plans, along with high-quality learning materials and ongoing teacher training. These coordinated inputs create consistency and coherence in educational practices, optimising the teaching and learning experience and facilitating effective instruction (Global Education Evidence Advisory Panel, 2023).
sub-Saharan Africa 'sSA'	A region consisting of the following countries: Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Republic of Congo, São Tomé and Príncipe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Tanzania, Togo, Uganda, Zambia, Zimbabwe (World Bank, 2024).
Treatment Effect	Changes in the Edo State education system outcomes (such as pupil learning levels) due to the EdoBEST programme (UNESCO, 2024).

Abbreviations

cwpm	Correct Words per Minute
DIBELS	Dynamic Indicators of Basic Early Literacy Skills
EdoBEST	Edo Basic Education Sector Transformation
FLN	Foundational Literacy and Numeracy
GDP	Gross Domestic Product
GPD	Global Proficiency Descriptors
GPF	Global Proficiency Framework
HIC	High-Income Countries
ICAN	International Common Assessment of Numeracy
LMIC	Low- and Middle-Income Countries
ORF	Oral Reading Fluency
NERDC	Nigerian Education Research and Development Council
RARA	Nigeria Reading and Access Research Activity
sSA	sub-Saharan Africa
SUBEB	State Universal Basic Education Board
UNESCO	United Nations Educational Scientific Cultural Organization
UNICEF	United Nations International Children's Emergency Fund
USAID	United States Agency for International Development

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I. Preamble

Foreword by Managing Director of EdoBEST, Enoh Ugbona

EdoBEST: Transforming education for a brighter future in Edo State

Education is the cornerstone of development for a productive, fulfilled citizenry. A high-quality education provides children with the foundation they need to prosper in their families, communities, and beyond by allowing them to develop the viewpoints that allow them to grow as engaged citizens. Therefore, providing children with a high-quality education is of the utmost importance. It is the duty of all teachers, school leaders, and decision makers in the State to ensure students in Edo receive the learning support they need in order to be successful.

Edo State's commitment to delivering powerful educational opportunities has been steadfast, remaining strong through multiple government administrations. After the launch of the Edo Basic Education Sector Transformation (EdoBEST) programme in 2018, I am pleased to report that the EdoBEST programme has expanded to include over 1,200 schools as of September 2024. As a result, over 388,000 children in Edo State are bolstered by a superior learning-focused environment and ample resources. The EdoBEST programme equips teachers and head teachers with motivating professional development, skillfully crafted lessons, and sophisticated technology so they are equipped to have a profound positive impact on students.

After over two years of operation, it is clear that these innovations have led to tremendous results. The following report – which tracks outcomes in Junior Secondary schools from the end of the 2021-22 school year to the end of the 2023-24 school year – details the achievements of the programme at each stage of its development. I am filled with gratification in seeing that students in these schools have been improving in foundational literacy and numeracy since the programme was launched in February 2022. Across all grades, these students are now better positioned to build on their successes and better their futures.

For the spirit of excellence that surrounds the programme, I would like to commend and thank Edo State for its great resolve to institute all that is required to usher in the most radical changes to Edo State's education system in a generation. In partnership with NewGlobe, Edo State has devoted its time and resources to uplift our schools while demonstrating a tireless faith in our vision. My final thanks go to all the teachers, children, and parents of the EdoBEST schools network for their trust in us. I commend their willingness to work with the EdoBEST team.

After more than half a decade of providing essential educational services via the EdoBEST initiative, we have celebrated many successes and worked through a number of challenges. Rigorous monitoring of the EdoBEST programme requires a continued commitment to identifying strengths and areas for improvement. Overall, it is our key responsibility to ensure that this highly beneficial approach is sustainable for the coming generations of students. I am confident that the programme will continue to support exemplary learning and build upon its core pillars for the fulfilment of Edo State's potential.



Enoh Ugbona

Acknowledgements

The successful completion of this study is due to the support and hard work of many people. First, we would like to thank the Edo State Government Administration for their commitment to transforming public education in Edo State, and for facilitating the completion of this study. We sincerely appreciate the government for the partnership and guidance they provide throughout the planning and execution of these studies. Many thanks to the EdoBEST team led by Michael Basanya, Oluwadare Adebisi, Faith Igbokwe and Jessy Efosa for the field support and coordination. We would also like to thank all head teachers, teachers, and students who welcomed the study teams into their schools and classrooms.

Finally, we owe our deepest gratitude to the team of enumerators who collected the data used to write this report, the backbone of this project. We wish to thank Abubakar, Safuratu Sadiq, Anthonia Omolondion, Morgan Akinyele, Aro Endurance, Prince Nwaogu, Atiborokor Patrick, Beauty Odogun, Blessing Enaholo, Bruno Abu, Kenneth Osaghae, Christiana Onosholema Eshemokhai, Clementina Iriogbe, Mac-Clifford Obamwonyi, Laura Otiti, Grace Obih, Collins Edugie Edugie, Marian Ifaroumhe, Deborah Anamhomhe, Ebosetale Osose Hebrewess, Faith Omogbai, Osariemen Okungbowa, Morgan Ebele, Famous Okhoue, Osarunmwense Erhunwense, Gloria Okojie, Ikhazuagbe Gloria, Jesuelo Ohwoka, Kingsley Akademe, Osariemen Okungbowa, Maria Bossey, Osahenoma Osayuware, Nelson Audu, Ogboko Anthony, Samuel Omoregie, Ogechi Obaseki, Iyoha Ikponmwosa, Omolara Oni, Osezua Ozinegbe, Osoba Obeimhen, Ozaveshe Kolawole Bello, Ejemhen Usiado, Precious Iyase, Faridah Abubakar, Sandra Emiulimhe Eghele, Sede Abraham Egwahede, Tunde John Omojowo, Adedoyin Adetunji, Umosekhaima, Jacob, Victor John Okologo, Violet Iyoha, Sharon Major, Edward Amrerhoro, and Dr Valentine Uyigye for their outstanding commitment and work in data collection.



II. The EdoBEST JSS Programme

Overview of the Programme

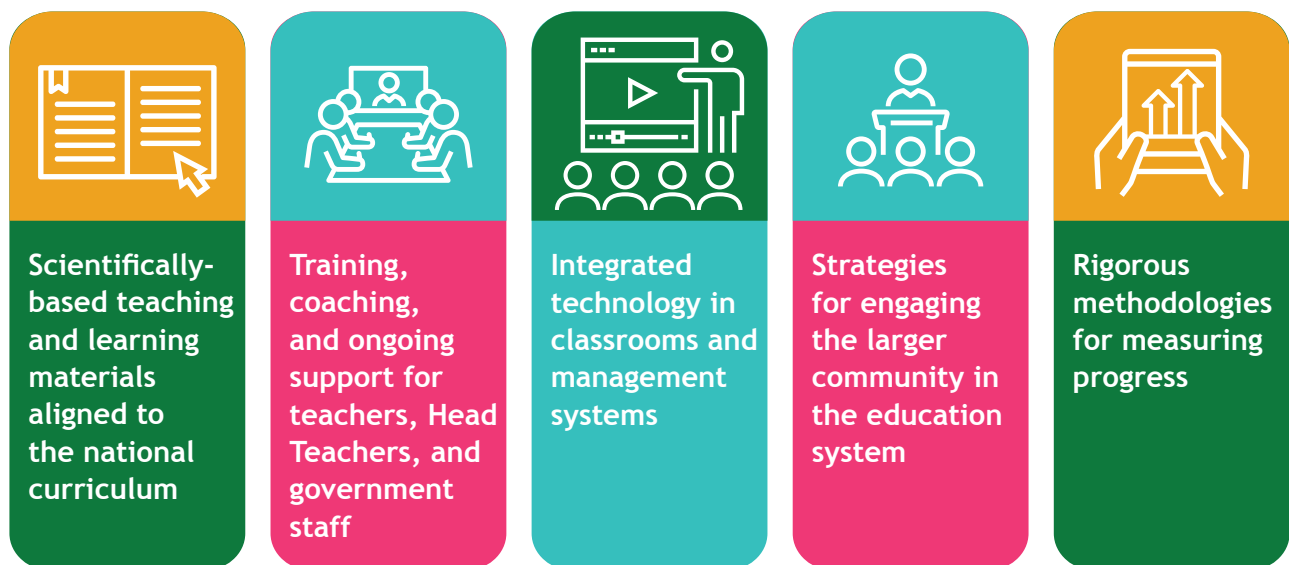
The Edo Basic Education Sector Transformation (EdoBEST) programme is a comprehensive, coherently designed programme that strengthens all aspects of public basic education - including both the Primary and Junior Secondary levels. It establishes a framework for effective management of the education system, improves teachers' pedagogical skills and professionalism, and raises students' learning levels across all subjects through adaptive approaches and a focus on foundational learning alongside syllabus mastery.

During the first 14 weeks of instruction during Term 3 of the 2021-22 school year, EdoBEST JSS was implemented in 235 junior secondary schools out of a total of 306 Junior Secondary schools in the State. This initial phase of the JSS programme reached over 23,000 students and over 1,500 teachers from all districts statewide, but was limited to only JSS 1. At the start of the 2022-23 school year, the programme was scaled to incorporate JSS 2 and JSS 3 students, expanding to 46 additional schools. As of the 2023-24 school year, 285 JSS schools participate in the EdoBEST JSS programme, reaching over 90,000 students.

The EdoBEST programme is a **comprehensive education improvement programme that combines a set of interconnected, scientifically-proven components that work in tandem** to address key challenges at all levels of the public education system. These components include:

1. Scientifically-based teaching and learning materials, following the principles of structured pedagogy, that align with national curricular standards
2. Training and ongoing support for teachers, head teachers, regional officers, and ministry staff
3. Integrated technology in classrooms and management systems
4. A strategy for engaging the larger community in education
5. Rigorous methodologies for measuring student progress and programme effectiveness, and for identifying areas for continuous improvement

The 5 Pillars of the EdoBEST Progressive Programme



1. Teaching and learning materials

EdoBEST's teaching and learning materials, along with training and ongoing support for teachers, are the essential elements of *structured pedagogy*, an effective teaching approach that utilises a defined framework with clear lesson plans, aligned materials, and consistent teacher training to provide an organised learning environment for students. EdoBEST provides teacher guides and student materials designed to ensure consistent, high-quality instruction across all classrooms. These resources are designed based on research in the science of learning and are adapted to the national curriculum as well as to current learning levels in Edo State. In addition, supplemental foundational content is used to support those students who have fallen behind JSS-level standards; this content is aligned with actual learning levels, to ensure that instruction can be aligned with students' current learning needs.

Detailed teacher guides

EdoBEST's teacher guides are comprised of highly detailed lesson plans that offer a clear roadmap for each class, providing educators with comprehensive, step-by-step guidance for delivering engaging and effective lessons. These plans include clear language for explaining concepts, posing questions, and providing feedback to students, ensuring consistency in instruction and appropriate pacing across all classrooms. Lesson plans have embedded in-class formative assessment strategies, which enable teachers to monitor students' progress in real-time and make necessary adjustments to instruction, ensuring mastery of key concepts and skills.

Lessons are designed with a focus on student-centred learning, incorporating a variety of engaging and interactive activities. These include guided practice, independent work, collaborative learning, and open-ended problem-solving exercises. Lessons employ the "model, lead, test" approach, where teachers first demonstrate a skill, then guide students in practising it together, before having students apply the skill independently.

Student materials

Complementing the teacher guides are aligned student materials, including textbooks and workbooks for some subjects and grade levels. There is an appropriate ratio of materials to students, ensuring that each student has the opportunity to work independently or take materials home as appropriate.

- **Textbooks.** Textbooks are carefully crafted to be engaging, culturally relevant, and fully aligned with the national curriculum. Structured to follow the scope and sequence of the teacher guides, these textbooks ensure seamless integration with daily lessons and are designed for repeated use throughout the school year.
- **Workbooks for each student.** Workbooks offer additional practice opportunities to reinforce key skills and concepts, both in class and at home. With activities carefully designed to align with lesson objectives, workbooks provide a gradual "release of responsibility", eventually enabling students to perform skills independently.

Assessments

Aligned with teacher guides and student books, the comprehensive assessment system is integrated throughout the learning materials. It includes:

- Formative assessments embedded in daily lessons
- Unit assessments administered at the end of each topic of study
- Termly and end-of-year assessments to track long-term progress

Together, these assessments enable the short- and long-term monitoring of students' learning progress, and enable stakeholders at all levels – from teachers to policymakers – to take data-informed actions that ultimately enhance learning outcomes.

2. Training and ongoing support for teachers, head teachers, regional officers, and ministry staff

EdoBEST establishes a multi-tiered support system that addresses the needs of teachers, head teachers, regional supervisors, and SUBEB staff. This system is designed to create a cohesive, self-reinforcing ecosystem of educational improvement that spans from individual classrooms to the SUBEB level.

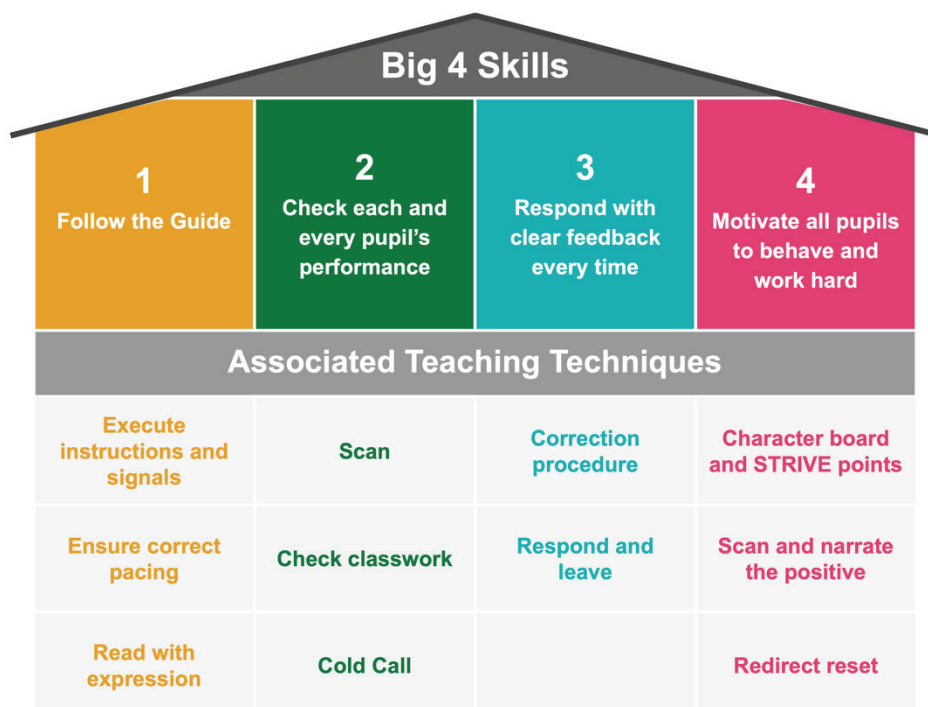
Teacher training

To ensure that teachers receive consistent, high-quality support throughout their professional journey, EdoBEST provides teacher training that is organised to reinforce specific pedagogical skills. The training approach is closely aligned with the teacher guides and student materials, ensuring that teachers are well-prepared to implement the programme effectively. At programme launch, teachers undergo induction training, and thereafter receive expert feedback and coaching on an ongoing basis.

Induction training based on the “Big Four” pedagogical framework

Every teacher in EdoBEST schools undergoes an intensive induction training programme that serves as the foundation for implementing the structured pedagogy approach. The 80-hour, in-person training, conducted over 10 days, is designed to help train all teachers on the use of the new teaching and learning materials (like the lesson plans) and effective foundational learning methodologies. The training programme is informed by scientific research on the teaching practices and habits of top decile teachers who have a proven track record of delivering large learning gains, and is centred around EdoBEST’s core pedagogical framework, “The Big Four Teaching Skills”:

- Follow the lesson guides
- Checking each student’s performance
- Providing clear feedback
- Motivating students to behave and work hard



During induction, teachers not only learn about these skills but also practise them in simulated classroom environments, receiving personalised feedback from training facilitators. By the end of induction training, teachers build mastery over a wide array of critical topics for teacher success such as content delivery and teacher-guide use, effective classroom management, behaviour management techniques, student assessment, providing individualised feedback, and building strong student and community engagement.

Ongoing support and coaching for teachers

Recognising that one-time training is insufficient to drive lasting change in teaching practices, EdoBEST includes a robust system of continued support and coaching for teachers. After induction, teachers receive ongoing professional development, delivered at the school level by head teachers, which reinforces core skills and trains them in new processes, skills, and tools. Teachers also undergo regular observation by head teachers and by regional officials, who are themselves trained in EdoBEST's pedagogical framework and are provided with tools for effective management (see below). Based on observations, teachers receive feedback in a reflective coaching conversation, which celebrates successes in addition to identifying areas for improvement.

Support for school leaders and regional officials

Head teachers and regional officials are central to EdoBEST's ongoing support system, and play a crucial role in ensuring the successful implementation of the programme's structured pedagogy approach.

EdoBEST equips head teachers to lead instructional improvements, conduct short daily classroom observations, provide timely and student-centred feedback, focus on student outcomes rather than on inputs, and engage productively with the community. To this end, head teachers are provided with training on EdoBEST's pedagogical framework, as well as with digital transparency tools such as Spotlight, which provides them with real-time data on key performance indicators - such as lesson completion rates and students' assessment scores - for each teacher. Equipped with these tools, head teachers check teachers' day-to-day basic implementation of the programme and provide data-informed feedback that is targeted to each teacher's specific needs.

Regional officials receive training and tools that enhance their ability to provide constructive feedback to educators under their supervision. This includes training on utilising digital transparency tools for school monitoring, such as web-based dashboards displaying aggregated data at the school level, as well as tools to aid structured classroom observations, the "Instructional Leadership" app - a tool for tracking whether teachers are keeping pace with the curriculum and delivering lessons as intended, and a troubleshooting platform through which they can request and receive support for technical issues.

Equipped with these tools, regional officials - with head teachers - observe entire lessons and provide in-depth coaching to further improve teachers' pedagogical techniques and performance. These longer observations complement the short daily observations described above, and follow a more structured format designed to promote teacher reflection and growth within the structured pedagogy framework. After observing the lesson - using the Big Four Teaching Skills framework as a lens - the regional official or head teacher engages the teacher in a reflective coaching conversation. Coaching conversations begin with the teacher self-reflecting on the lesson, identifying what went well and areas for improvement. The observer then shares their observations, using specific examples from the lesson to illustrate key points. Together, they identify 1-2 areas for the teacher to focus on improving before the next observation, always linking these areas to the Big Four Skills and the principles of structured pedagogy. Importantly, coaching conversations do not simply address weaknesses; they also celebrate successes and identify best practices that align with the structured pedagogy approach. Over time, these conversations build a collaborative, growth-oriented culture within the school, centred around the consistent implementation of effective teaching practices grounded in the Big Four.

3. Technology integration

EdoBEST integrates technology into all aspects of the programme, from the delivery of instructional content into each classroom to system-level management. EdoBEST's technology platform includes multiple modules, each dedicated to enhancing a particular aspect of the programme.

In the classroom, teachers use tablets to access the **Learning Management Module**. This includes a digital academic schedule that allocates time for each subject in a manner designed to maximise learning, as well as digital teacher guides with high-quality lesson content, and a digital messaging platform for obtaining academic and operational guidance. The module also enables central planners to track lesson delivery (start and end times, pacing, and completion rates), and includes a central web application for lesson and assessment scheduling, management, and ongoing content adaptation.

In schools, head teachers use the **Accountability & Professionalism Module** to track and validate teacher attendance, track student attendance, and manage student rosters, as well as to access management resources such as classroom observation tools. The **Pupil Performance Module** enables teachers, head teachers, and central planners to measure and monitor student success - through tools that allow for the automatic entering, grading, and management of student assessment scores, as well as tools for managing student class assignments and grade promotion.

At a system level, several modules ensure transparent and ongoing monitoring of performance and enable data-driven decision-making. The **Reporting & Transparency Module** includes a web-based dashboard that displays aggregated and disaggregated data on students, teachers, school leaders, lesson completion, and other indicators of professional accountability and programme operation. The **Back Office & Support Module** provides system-level management and support with functionalities replicated from the Pupil Performance Module, including systems to manage teacher induction training (trainee attendance tracking, training session content delivery, etc.) and to manage digital devices and other assets.

Importantly, the EdoBEST technology platform is specifically optimised for low-infrastructure environments - such as those with low and/or infrequent electricity or low-speed/unreliable data access, ensuring effectiveness in even the most marginalised communities.

Beyond system integration, EdoBEST builds capacity among school staff and government officials at all levels and ensures that they are equipped with the skills to utilise the programme's full suite of technological tools. Teachers, as part of induction training, learn how to navigate digital lesson plans, monitor real-time class progress indicators to adjust their pace of instruction, quickly record attendance, and analyse class-wide performance patterns over time. Government support teams responsible for classroom observations and teacher/head teacher support receive training on utilising the programme's web-based tools, which provide real-time data on instructional delivery, learning outcomes, attendance, and accountability at both aggregated and disaggregated levels. By providing both the technological tools and the relevant training to leverage them, EdoBEST empowers all stakeholders within the education system.

4. Community engagement

Creating and implementing a comprehensive community engagement strategy

Research has shown strong connections between family involvement and students' academic achievement. The earlier teachers and head teachers establish robust family engagement with the education system, the more effective they are in raising student performance over time. Family partnerships formed during Junior Secondary school years build a strong foundation for future student success and sustained engagement. When students receive more support, classrooms with engaged families perform better overall.

Drawing from these research findings, EdoBEST includes a strong component of community engagement aimed at not only improving student learning but also enhancing the community's trust in government schools. Community and parent engagement activities are embedded as a core component of the programme, raising collective awareness of the importance of quality education and fostering a greater sense of community ownership and pride in the newly transformed schools. Activities include:

- **Parent & community orientations:** Designed to provide information about the government programme to all stakeholders in the community, including parents and local leaders, and explain how it will strengthen each school.
- **Parent-teacher conferences:** Vital for fostering positive relationships between parents, teachers, and head teachers, they invite parents to play an active role in their child's education. At the centre of the Parent-Teacher Conference is a review of each student's current performance and how to support continued growth. These structured and meaningful interactions bolster the support students receive at home and in school.

Additionally, a locally-based communications team for the programme works with existing local initiatives to promote the importance of school enrolment, retention, and educational outcomes. These joint efforts bring together key stakeholders, facilitate the sharing of information and ideas, and enhance the broader community's engagement with the education system.

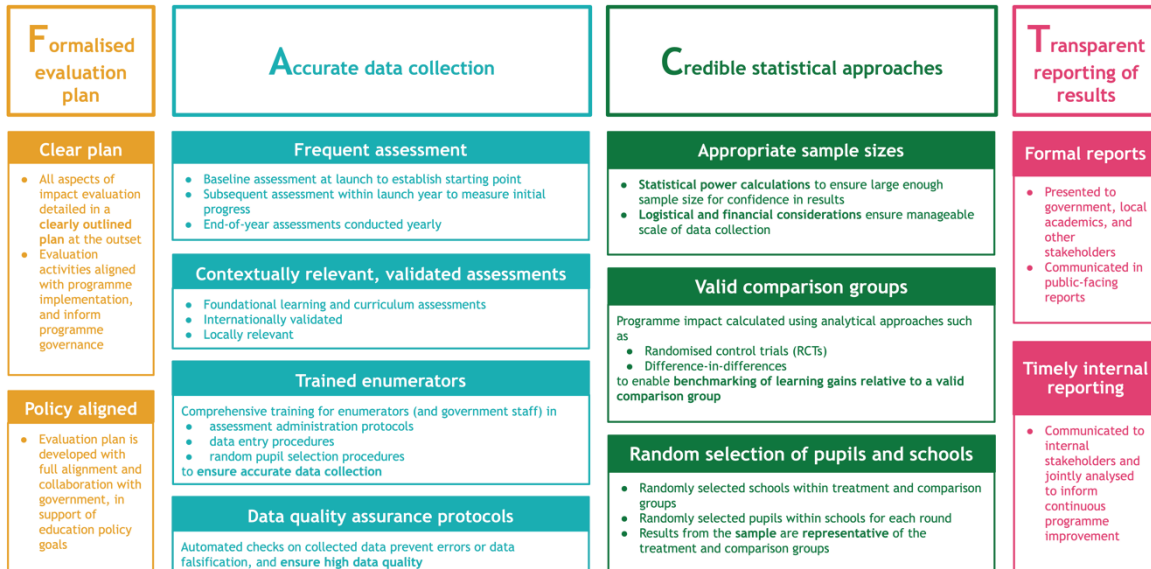
5. Rigorous methodologies for measuring programme effectiveness and identifying areas for improvement

A key pillar of EdoBEST is the systematic and continuous monitoring of educational outcomes to understand the learning gains driven by the programme and, importantly, to continuously identify areas for further improvement. This is achieved through **impact evaluation studies** as well as **ongoing monitoring** of learning levels and other programmatic Key Performance Indicators (KPIs).

Impact evaluation

Impact evaluation studies are conducted at major milestones such as the ends of school years. These studies are rigorous measurements of programme impact, and are designed following the "FACT" principles. Per these principles, EdoBEST's impact is measured using a formalised evaluation plan that is clearly articulated at the outset and fully aligned with the government's policy goals. Data collection is carried out in a manner that maximises accuracy, and data are analysed using statistical approaches that maximise the validity of the results. Results are then shared in a transparent manner to inform ongoing programmatic decision-making.

“FACT”: Principles Guiding the Design of EdoBEST’s Impact Evaluations



Ongoing monitoring of programmatic impact and identification of areas for continuous improvement

In addition to formal impact evaluation studies, EdoBEST monitors learning outcomes and other indicators of programme performance in an ongoing fashion, so that insights can continuously inform programme implementation.

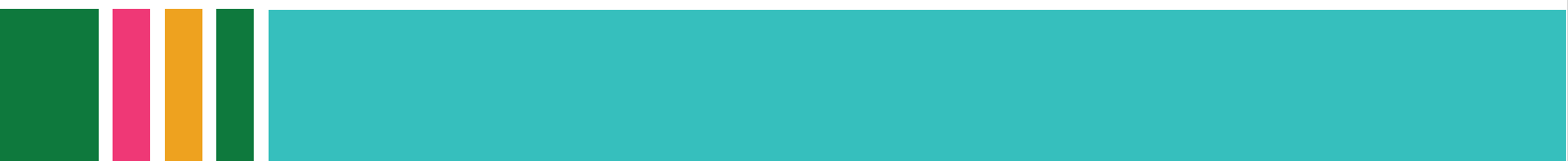
Ongoing monitoring of learning outcomes

The use of **Let’s Mark!**, a phone-based application for automated grading and uploading of student- and item-level data to centralised platforms, enables ongoing analysis of performance trends that inform programmatic decision-making, while also saving teacher time and increasing the accuracy of the marking process. “**Termly assessments**” - teacher-led assessments of learning in all subjects, which are standardised across the programme - are conducted at the end of each term, enabling the identification of areas, schools, or teachers that are not performing at expected levels and require additional support.

Ongoing monitoring of other key performance indicators

EdoBEST tracks all core operational and performance drivers that contribute to improved teaching and learning - such as **student and teacher attendance, lesson completion, school leader coverage**, and more. Digital tools capture these data automatically and in a decentralised manner, and a **Data Analytics Team** collaborates closely with programme leadership to analyse data trends and leverage insights to inform strategic programme improvements.

Together, the five pillars of EdoBEST - Scientifically-based teaching and learning materials, training and ongoing support for teachers and their supervisors, integrated technology, community engagement in education, and rigorous methodologies for measuring progress - work in synergy to drive dramatic improvements in teaching and learning across public-JSS schools in Edo State.



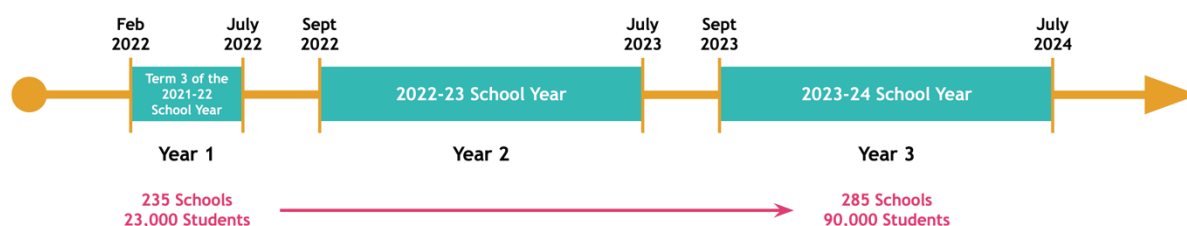
III. Methodology

Longitudinal Monitoring of Changes in Educational Outcomes

Because the EdoBEST programme has been implemented in the vast majority of public JSS schools in Edo State since the 2022-23 school year, there is no comparison group that would allow for the use of an empirical strategy such as the difference-in-differences method or a randomised control trial. Instead, this study utilises a descriptive analysis, assessing learning outcomes and programme implementation metrics (such as attendance and lesson completion rates) at the end of each school year and monitoring changes over time – both since July 2022, and year-on-year. While longitudinal monitoring effectively showcases how EdoBEST schools have evolved since the programme was implemented, any changes that occur in learning outcomes, lesson completion rates, or attendance cannot be solely attributed to the EdoBEST programme.

Data collection timeline

The EdoBEST programme was first introduced to Junior Secondary Schools in February 2022. While baseline data were collected at the time of launch, prior analyses found no measurable impact on learning outcomes during the initial 14-week period. As such, the current study includes three rounds of end-of-year data collection. The first round occurred at the end of the 2021-22 school year (July 2022), and subsequent rounds of data collection took place after each full school year through July 2024.



Sampling Schools and Students

School selection

At baseline and in July 2022, 85 schools were sampled – 50 randomly selected schools that joined the EdoBEST programme, and 35 schools that had not yet joined the programme. Because the 50 treatment schools were randomly selected, they are representative of the first cohort of EdoBEST JSS schools, which included approximately 75% of all JSS schools in the state. In July 2023 and 2024, data were planned to be collected from these same 50 schools. However, due to safety concerns and logistic impediment during at least one of the rounds of data collection, data could not be collected from 6 of the original 50 schools. Consequently, the data from the 44 EdoBEST JSS schools that were able to participate in all rounds of data collection were used to evaluate the evolution of the Edo State JSS education system since the EdoBEST programme was introduced.

Student selection

Across all data collection rounds (July of 2022, 2023, and 2024), 1,464 randomly selected students were assessed on average in each round. Because all sampled students were randomly selected from the pool of statistically representative schools, they approach being a rigorous subsample from which valid conclusions about JSS across Edo State can be drawn. Because the programme was only rolled out to JSS 3 students in September of 2022, and because insufficient data were collected from JSS 3 in July 2023 due to exam scheduling conflicts, this report does not use JSS 3 data in reference to the changes in learning over time of the EdoBEST JSS programme.

Box 1: Rationale for Randomised Sample Selection

Research that assesses the state of education systems and measures the impact of education interventions is invaluable to policymakers and practitioners, as it facilitates informed decision-making and policy formulation. However, for this research to be truly informative, it is crucial that it accurately capture outcomes representative of the entire system for which decisions are being made. Ideally, with unlimited research resources, data would be collected from every school and student within an education system to ensure representativeness. Unfortunately, the process of collecting high-quality data is costly, time-consuming, and logistically challenging, which in turn necessitates that stakeholders and researchers collect data from a sample rather than the entire population. Therefore, for the results to be accurate, reliable, and informative, even when drawn from a smaller subset of schools, the sample must be selected in an unbiased manner (Banerjee, 2016), such that the smaller group is, on average, as similar as possible to the full population of interest.

Samples that are manually selected or chosen with undue preference for units with certain characteristics typically incur selection bias. Selection bias occurs when sample selection is based on characteristics not shared by the entire population, resulting in a sample that disproportionately represents those characteristics and thus produces skewed, inaccurate results. For example, consider a study measuring the learning levels in a given country. If the sample of schools selected to participate in such a study comes exclusively from schools within the capital or those that a particular government officer is most familiar with, the results are likely not representative of the entire country. In this example, schools in the capital or those known to the government officer had a higher chance of being selected than their counterparts. Consequently, the results emerging from this study would not be representative of the full country, and policy decisions based on such findings would be misguided, potentially harming a larger population beyond the initially selected group.

To mitigate selection bias, researchers often utilise randomised sample selection, where participants in a sample are chosen at random, often using computer software. This process ensures that all members of a given population – i.e. all schools in an education system or all students in a class – have an equal chance of being included in the sample, rather than being disproportionately selected, intentionally or unintentionally, based on characteristics that may influence the study's results.

Random selection of samples from a population must be coupled with a minimum sample size or a minimum number of participants, which is often determined using statistical methods, to adequately represent the population within a certain margin of error. For example, if there are 1,000 schools in a state, a sample of one school would not represent the population – even if this school was randomly selected. In contrast, when this method is used to select an adequate number of participants per statistical guidelines, it allows researchers to confidently draw high-quality conclusions regarding the population in question, knowing there is minimal measurement error stemming from poor sampling approaches. Reconsider the above example: if an adequate number of schools were selected at random across the entire country, the sample would include students and schools with a mix of characteristics, rendering the study's findings applicable to the entire population in the country of interest.

In all, randomised sample selection serves as an indispensable tool in the evaluation of large-scale educational programmes. With it, a sample can be cost-effective, logistically manageable, and able to yield insights representative of the entire population, leading to informed, evidence-based policymaking and improved educational outcomes.

Learning Assessments Used

English oral reading fluency

DIBELS and NERDC textbook passages

Reading fluency describes the degree to which a student can read quickly, accurately, and with expression. If a student is able to read quickly and with ease, it is a strong signal that they have also mastered more fundamental subskills (e.g. letter recognition), and that they are capable of completing increasingly advanced tasks, such as reading with some degree of comprehension. Reading fluency is measured in “correct words per minute” (cwpm).

This study relies on two types of passages to measure English reading fluency:

1. A **JSS1-level text drawn from DIBELS**, a reliable assessment of early literacy development widely used in evaluation studies of educational interventions (University of Oregon, 2018; Vernon-Feagans et al., 2018; Cheung, A. C. K & Guo X., 2018; Kim et al., 2011). All students read this JSS1-level text. The purpose of using this text to assess all students is to allow for comparison of performance across grade levels.
2. A **grade-level passage from NERDC-approved English textbooks**, assesses the degree to which students can appropriately engage with the grade-level materials.

Reading comprehension

In addition to reading fluency, students are also assessed on their reading comprehension. After students complete the fluency assessment, they are asked to answer two reading comprehension questions related to the text: one being a direct question for which the answer could be found directly in the text and the other being an inferential question where the answer must be deduced from the text. These questions were internally developed by the EdoBEST team.

Mathematics proficiency

International Common Assessment of Numeracy Plus (ICAN+)

Students’ mathematics skills were assessed using ICAN, an internationally validated tool that measures learning across five core maths skills: number recognition, addition, subtraction, multiplication, and division. Within each of these domains, there are 2 sub-tasks. Sub-task 1 is a simple application of the concept (for example, addition without carrying). If the student answers sub-task 1 correctly, they attempt sub-task 2, which is a more challenging application of the concept (for example, addition with carrying). Two of the domains (subtraction and division) also include a separate word problem as part of sub-task 2. To assess students on higher-level math skills, a supplemental section was internally developed and included to the ICAN. This addendum includes two operational tasks and four word problems regarding fractions and equations, designed to cover more grade-appropriate topics. This expanded version of the ICAN tool is referred to as ICAN+.

Monitoring Programme Implementation

Teacher attendance, student attendance, and lesson completion rates

The programme's technology allows the EdoBEST team to collect data on student attendance, teacher attendance, and lesson delivery in real-time. Tracking these metrics and comparing data over time can yield insights on longitudinal trends in instructional quantity. For more information on the importance of teacher attendance, see Box 2.

Box 2: Teacher Absenteeism in Low- and Middle-Income Countries: Challenges, Implications, and Effective Solutions

Teacher absenteeism is a deep and widespread challenge that jeopardises returns on substantial investments in student learning outcomes and enrolment outreach (World Bank, 2018). Teacher salaries in low- and middle-income countries (LMIC) often represent a significant portion of the public education budget. For instance, in Uganda, Tanzania, Nepal, and Namibia, 60-95% of the government budget that is earmarked for education is invested in teacher salaries. Yet, high rates of teacher absenteeism have been consistently recorded across many LMIC: In a global study, teachers were not in school 16% of the time in Bangladesh, 18% of the time in Togo and Senegal, and 45% of the time in Mozambique (Chaudhury et al., 2006). Even among the teachers that were present in school across 8 sub-Saharan African countries, less than half of them were found to be in their assigned classrooms during instructional time when measured by the World Bank via drop-in visits (World Bank, 2018). Hence, the large shares of fiscal resources spent on teacher salaries, coupled with the ingrained prevalence of teacher absenteeism, indicates that the fiscal and educational repercussions of this issue are a serious policy concern that deserve immediate governmental action.

From a fiscal standpoint, one study in India found that an unauthorised teacher absence rate of 23.6% cost the government an estimated 1.5 billion INR in 2017 alone (Muralidharan et al., 2017). The World Bank has estimated that teacher absences also cost Senegal, Mozambique, and Tanzania over 300 million USD each in 2013 (World Bank, 2018). This financial loss not only correlates with diminished learning gains due to inadequate instruction time and quality, but also with the payment of salaries using limited government funds in contexts where public budgets are particularly constrained.

For the students in the system, the most direct consequence of teacher absenteeism is significantly reduced instructional time, which, in turn, translates into weaker learning outcomes. According to The World Bank's Service Delivery Indicators, out of the 8 LMIC that were surveyed in sub-Saharan Africa, including Nigeria, Kenya, Uganda, and Togo, an average of 2 hours and 46 minutes of instructional time was lost daily due to teacher absenteeism (World Bank, 2018). Teacher absenteeism not only detracts from total learning time, but also negatively impacts the quality of learning that takes place in school (Méndez Vargas, 2016). When classes are combined to compensate for inconsistent teacher attendance, students experience disruptions in their lessons. Furthermore, chronically absent teachers were found to be less productive in school when compared to their peers (Utami & Vioreza, 2021). This lack of consistency and quality contributes to parents' and students' poor perceptions of the public education system, which leads to lower rates of enrolment and attendance among students, therefore permanently stunting their positive educational trajectories (World Bank, 2018).

High rates of teacher absenteeism are symptomatic of inadequate management systems and data tracking, which fail to facilitate accountability and motivation. Investment in increased teacher attendance can lead to efficient national education systems that yield greater learning outcomes. By not targeting educational management systems and data collection, national governments are continually funnelling funds into an ineffective education system which produces increasingly diminished returns.

Fortunately, cost-effective, evidence-based solutions have been shown to yield high-impact results that mitigate the harmful consequences of this systemic issue. Studies done by the World Bank and UNICEF suggest that funds should be directed towards improving accountability systems and to the oversight of teachers rather than other applications, such as blindly increasing teacher staffing rates or implementing unconditional salary increases. For example, one study in Chile found that increasing teacher salaries by 4-30% decreased instructional time per student by an average of 1 hour a week, and another study in Indonesia found that the unconditional doubling of teacher salaries did not lead to better self-reported attendance or, most importantly, improved student learning outcomes (Méndez Vargas, 2016; Utami & Vioreza, 2021). Conversely, cost-effective interventions that have been shown to significantly decrease teacher absenteeism include in-person or technological accountability systems, supportive and competent management, and increased data tracking. When studied in India, attendance tracking systems that relied solely on self-reporting among teachers were found to be ineffective. Instead, randomised, unannounced drop-in visits and daily check-ins to monitor both attendance and curriculum progression were found to produce substantial improvement, and ultimately increased the productivity of the existing workforce (Muralidharan et al., 2017). Therefore, investing in these systems that improve visibility of stakeholder behaviour and allow policymakers to better support teachers on a national level yields increased teacher attendance, performance, and, consequently, greater returns in student learning outcomes.



IV. The State of Learning in Edo JSS Prior to the Programme

Students Were Unable to Meet Reading Fluency Benchmarks, Despite the Success of EdoBEST Primary

Despite the widespread positive impact of the EdoBEST Primary programme, learning outcomes in Edo JSS schools remained concerningly low. In March of 2022, 1 in 5 JSS 1 students could only read 10 cwpm or less. In other words, it took 20% of JSS 1 students at least six seconds to read a single English word. Researchers estimate that the bare minimum reading fluency rate needed for reading comprehension is 45 cwpm (Abdazi, 2011). 50% of JSS 1 students did not meet this threshold, meaning they could not read fast enough to understand the text. These poor fluency rates were not exclusive to JSS 1. Before the programme was implemented, the average JSS 2 student in Edo State could only read 76 cwpm from a JSS1-level passage. On the same passage, the average JSS 3 student only read 81 cwpm. For context, students in high-income, English-speaking countries read 100 cwpm by the end of Primary 2 on average. Therefore, regardless of grade level, most JSS students in Edo were dramatically underperforming in English reading fluency.

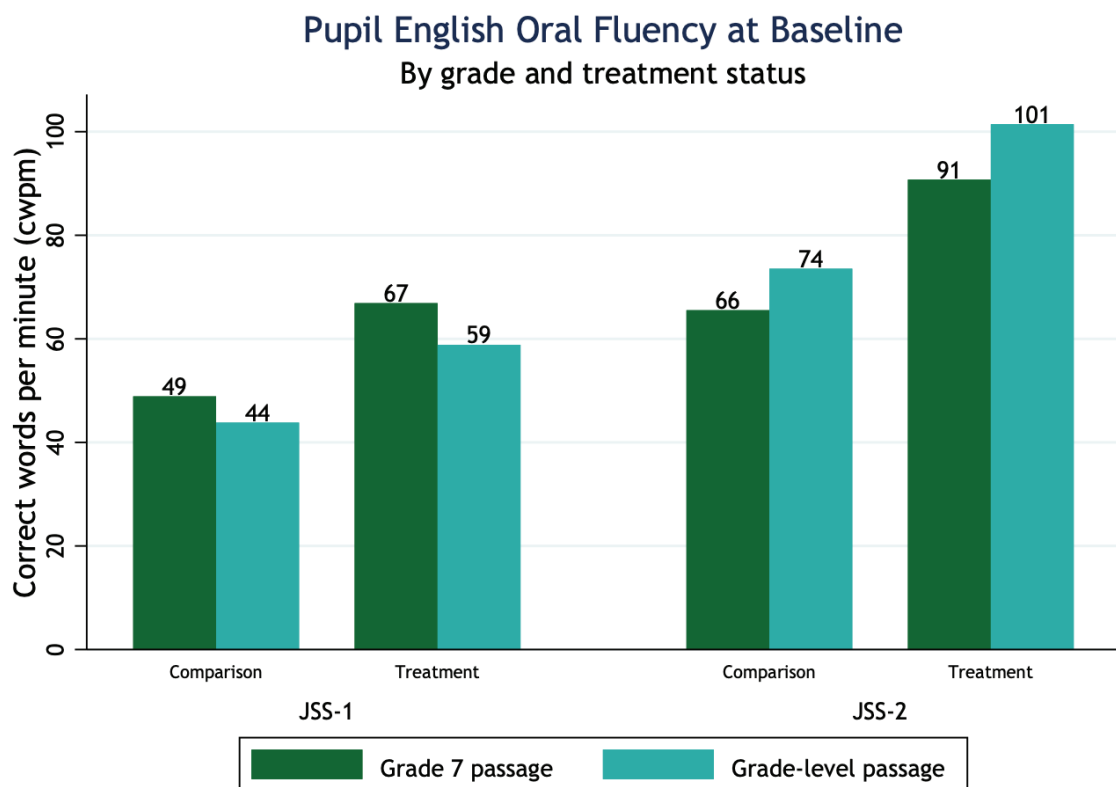


Figure 4.1



The fact that reading fluency rates in JSS 1 prior to the programme were found to be so low, despite the success of the EdoBEST Primary programme, requires deeper investigation. Had there been no changes in the student population from Primary 6 to JSS 1, one would expect the two groups to have similar score distributions or for the JSS sample to be slightly higher performing. However, as demonstrated by the figure below, the distribution of reading fluency scores in JSS 1 was significantly more skewed towards weak performance than EdoBEST Primary 6 fluency rates from the previous year, with a large peak in the 0-30 cwpm range. Consistent with this, in Term 3 of 2021, only 4% of Primary 6 students in EdoBEST Primary schools were classified as non-readers, whereas in term 2 of the following year, a much larger share – 16% – of Edo JSS 1 students were classified as non-readers. While a slight decline in reading fluency proficiency from Primary 6 to JSS 1 was expected, the magnitude of this disparity – along with the markedly different distribution curves – suggests a compositional change in the cohort enrolled in Edo JSS during the first 14 weeks of instruction. In other words, it is possible that the increased rate of non-readers from Primary 6 to JSS 1 can be attributed to an influx of students who did not attend EdoBEST Primary.

Distribution of Reading Fluency Scores Primary 6 (T3 2020-21) vs. JSS1 (T2 2021-22)

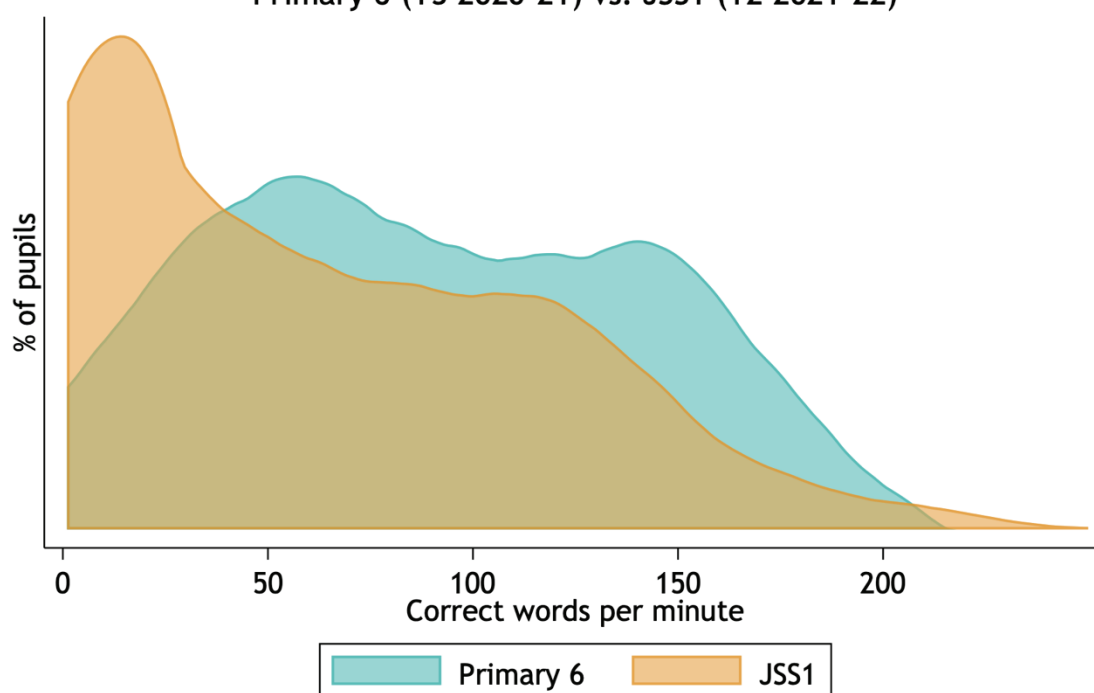


Figure 4.2

In JSS 3, reading fluency levels were higher, notably reaching nearly 100 cwpm when assessed with the grade-level passage. However, this figure should be interpreted with caution. Chronic absenteeism and high dropout rates are prevalent in Edo State, with an average of 13% of students leaving school before reaching JSS (National Population Commission, 2015). Because high performing students are more likely to stay in school, the JSS 3 sample in this study is likely disproportionately higher performing than the group of students assessed for JSS 1. Therefore, the differences in learning outcomes within this report between JSS 1 and JSS 3 may be overstated. Taken together, these data demonstrate that JSS students in Edo State were in great need of a revised curriculum with a focus on foundational literacy before the programme.

JSS Students Struggled to Solve Basic Maths Problems

A similar trend to that seen in reading fluency was observed for basic mathematics skills measured at the start of the EdoBEST JSS programme. Concerningly, 10% of JSS 1 students could not solve a simple addition problem ($32 + 15$), and 20% were unable to solve a simple subtraction problem ($46-21$), despite having spent nearly seven years in the education system. According to the NERDC, students should master these operations by the end of Primary 2. Therefore, according to national standards, 10% of JSS 1 students in Edo State’s public schools are five years behind where they should be in terms of basic maths skills.

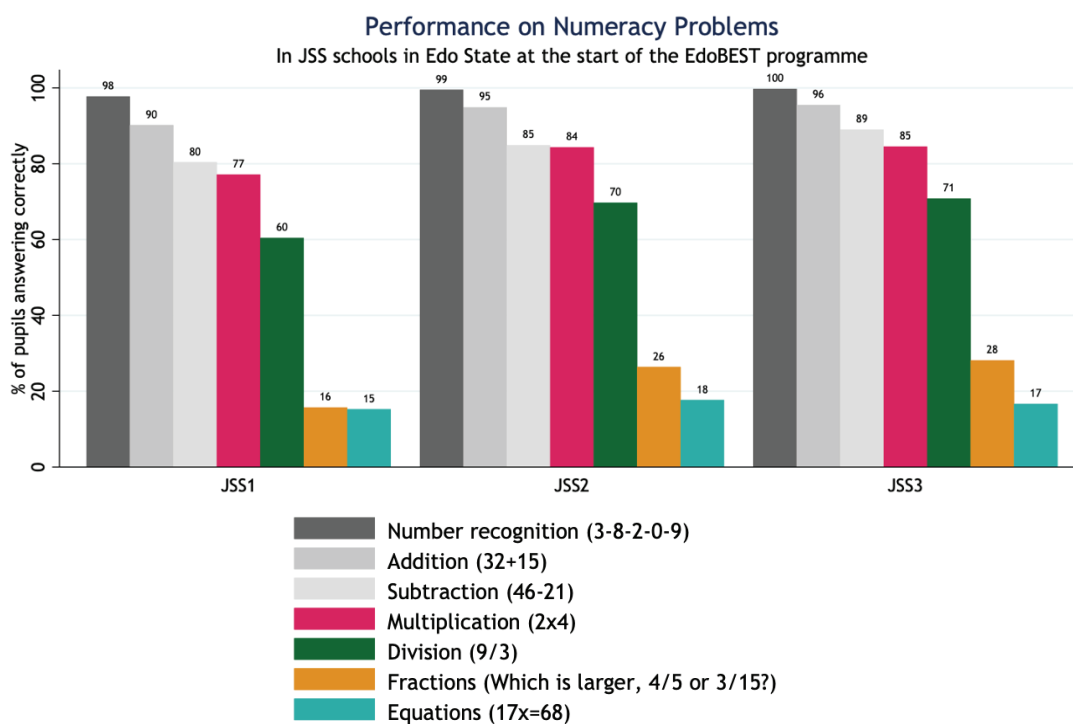


Figure 4.3

Furthermore, few students were able to solve slightly more complex problems. Before the programme, half of all JSS 3 students could not solve a subtraction problem with borrowing such as ‘78-29’. The average JSS student could not correctly answer questions such as ‘Which is larger, 4/5 or 3/15’, or equations such as ‘17x = 68’. According to NERDC curricula, students are expected to “apply trigonometric ratios in solving world problems” by JSS 3. Yet, only 20% of students could solve problems involving “simple” fractions and algebraic equations. Therefore, JSS students on average lacked the basic skills required for them to engage with grade-level maths problems, limiting their ability to realise their academic potential.



V. The Cumulative Impact of the EdoBEST JSS Programme

Foundational Literacy

Reading fluency rates in Edo JSS schools have improved considerably

In just the last two years of the EdoBEST programme being implemented in JSS, reading fluency rates for JSS 1-2 students on a JSS1-level passage have improved by 22 cwpm, on average (Figure 1 in Appendix B). In particular, JSS 1 reading fluency rates increased substantially. **Within two years, the average reading fluency rate of a JSS 1 student on a JSS1-level passage increased by 37% (24 cwpm)** (Figure 5.1). In fact, JSS 1 students can now read nearly as quickly as JSS 2 students did on average just two years prior. These improvements in reading fluency have likely also increased students' capacity to learn in their other subjects. Average gains were more modest, yet still positive, when students were assessed with a grade-level passage (Figure 2 in Appendix B).

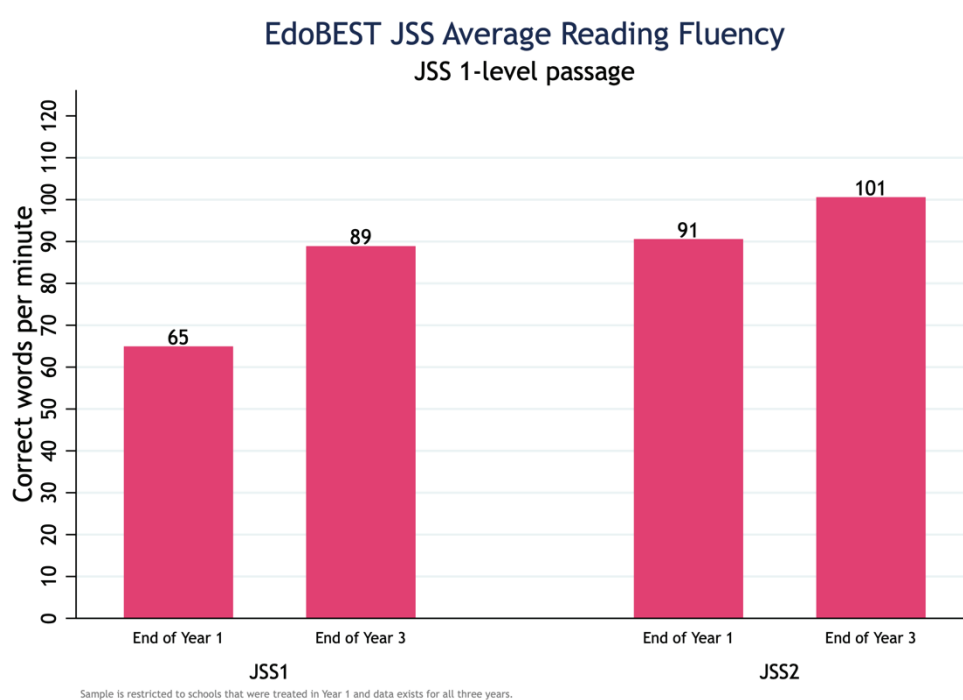


Figure 5.1

The rate of non-readers has halved after just two years

The programme is effectively addressing the needs of students who require the most support. At the end of the 2021-22 school year, 10% of the students in the representative sample were unable to read a single word from a JSS1-level passage (Figure 3 in Appendix B). In other words, 1 in 10 JSS 1-2 students were unable to read a simple English word such as ‘are, the, and in’ despite having spent at least six years enrolled in school. **As of July 2024, that percentage has dropped to just 5% (1 in 20 students), effectively halving the rate of non-readers.** These improvements were primarily driven by JSS 1, where the rate of non-readers was reduced by 8 percentage points, from 13% to 5% (Figure 5.2). Similar improvements were observed with grade-level passages, with the rate of non-readers decreasing from 11% to 6% across JSS 1-2 (Figure 4 in Appendix B). These results demonstrate significant progress in improving literacy outcomes for the most struggling students, underscoring the programme’s effectiveness in narrowing the gap for those most in need of support.

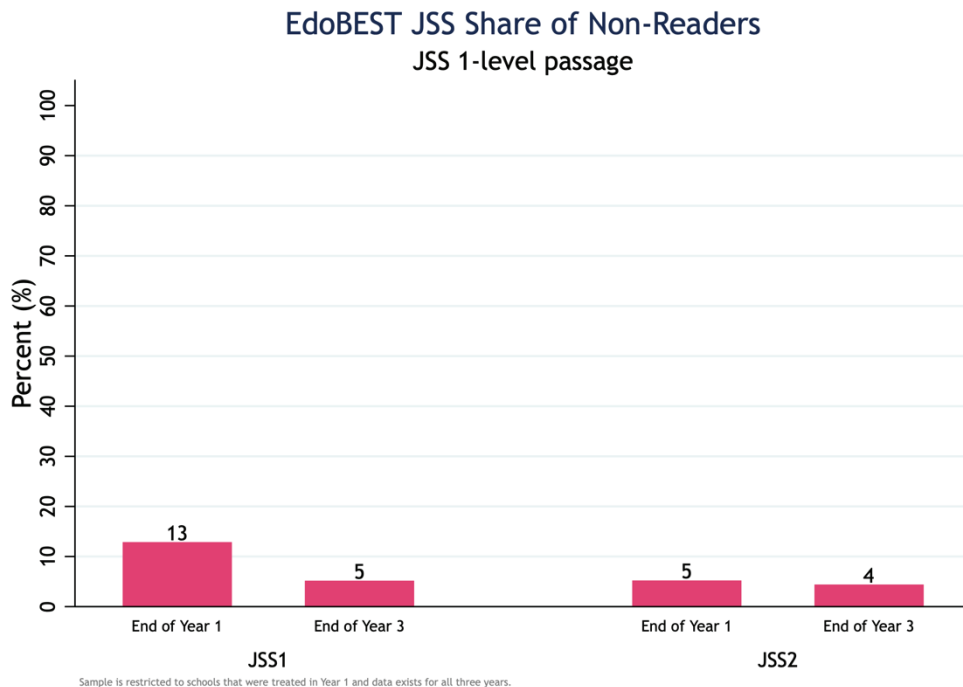


Figure 5.2

Despite considerable advancements in reading fluency with the EdoBEST JSS programme, reading fluency rates among JSS students remain low in absolute terms. According to DIBELS, the internationally recognised organisation responsible for developing the JSS1-level reading passage, students who read 124 correct words per minute (cwpm) or fewer are classified as “at-risk” – meaning that their English reading fluency falls well below the grade-level benchmark and that they may experience reading difficulties (see Appendix C for more information on DIBELS benchmarks and risk classifications). These “at-risk” students require targeted and intensive reading interventions to enhance their literacy skills and ultimately meet grade-level expectations (University of Oregon, 2020). Although the average oral reading fluency rate on a JSS 1 passage has increased by 22 cwpm since the programme was implemented, a majority of students in EdoBEST JSS are classified as ‘at-risk’ as of July 2024. Consequently, further efforts are needed to ensure that the Edo State education system equips students with the literacy competencies necessary to align with international standards.



Reading comprehension scores have improved considerably

Because the vast majority of EdoBEST JSS students can now read a grade-level passage with reasonable fluency, the focus of English instruction shifts towards strengthening reading comprehension to ensure that students can meaningfully engage with academic content across subjects. Impressive gains have been made in this area overall. **Across JSS 1-2, average reading comprehension scores on a JSS1-level passage increased by over 30%, from 19 to 25 percentage points within two years (Figure 5 in Appendix B).** These improvements were more concentrated in JSS 2 classes, with the average JSS 2 reading comprehension score increasing by 7 percentage points, compared to a 5 percentage point increase in JSS 1 (Figure 5.3). On a grade-level passage, scores improved at a similar rate in JSS 2 – from 34% to 44% – while scores in JSS 1 remained consistent over the two-year period (Figure 6 in Appendix B).

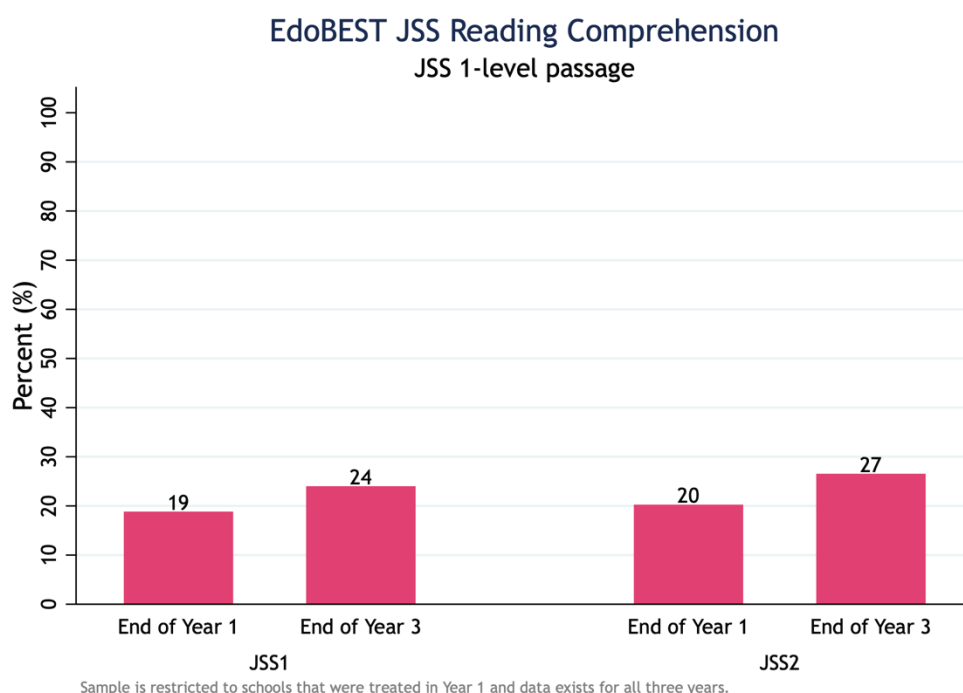


Figure 5.3

The patterns seen among EdoBEST JSS students reflect the typical progression in developing strong reading skills. JSS 1 students show rapid gains in reading fluency, while JSS 2 students focus more on reading comprehension – an indication that they are transitioning from learning to read to reading to learn. While these stages are ideally completed in Primary school, the current progress remains a promising sign that students are gaining the skills needed to engage more deeply with academic content and advance in their education. Moreover, the continued progress in English literacy indicates that EdoBEST JSS is effectively supporting students at different stages in their learning journey, even if they perform below grade-level expectations. Ultimately, these outcomes demonstrate the effectiveness of EdoBEST’s data-driven levelling approach; by meeting students at their learning levels, the programme is able to cater to diverse learning needs while simultaneously elevating average performance.

Foundational Maths

EdoBEST JSS students in 2024 are more proficient in maths than JSS students in 2022

Maths proficiency rates have substantially increased since July 2022. JSS 1 and 2 ICAN scores are 7 percentage points higher on average than they were in July 2022. Scores among JSS 1 students have improved slightly more, with the average JSS1 score increasing by 8 percentage points compared to the 6 percentage point improvement among JSS 2 students. **Importantly, this means that JSS 1 students are now scoring higher on the ICAN than JSS 2 students did two years prior.** In fact, both JSS 1 and 2 students now score above 50% on the ICAN on average, meaning that the typical JSS student in Edo State can now correctly solve at least 9 of the tasks on the ICAN+ assessment.

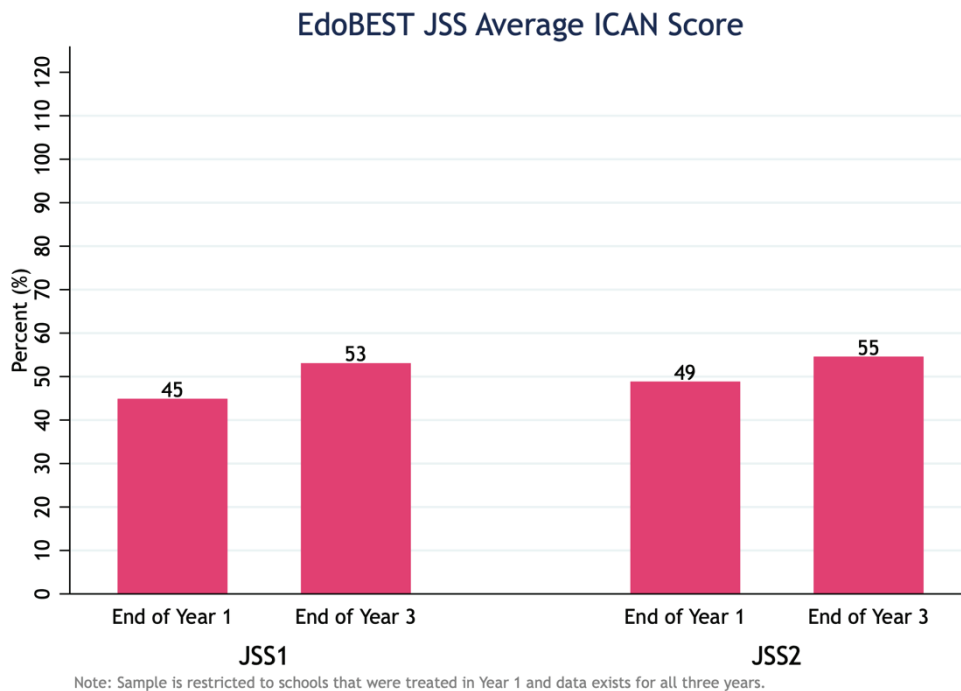


Figure 5.4

There have been large improvements across a range of maths subskills

The increase in average ICAN scores was driven by gains across many subskills, with the most substantial improvements seen in more advanced operations like division and multiplication. For instance, average scores on exact short division problems improved by 20 percentage points in JSS 1-2, with 8 in 10 JSS 1-2 students now able to correctly solve problems such as $9 \div 3$ (Figure 5.5). There were also large gains on a more complex division problem; when asked to perform division with a remnant (e.g. $93 \div 7$), 39% of JSS 1-2 students were able to correctly answer the question, compared to an average of 27% two years ago (Figure 7 in Appendix B). In JSS 1, average scores improved by more than 50% (13 percentage points) on this skill. Importantly, for both division subskills, the share of JSS 1 students who can solve these problems is considerably higher than that of JSS 2 students from two years ago – meaning that **today’s JSS 1 students are performing more than a full grade level ahead of where they would be without the EdoBEST programme.**



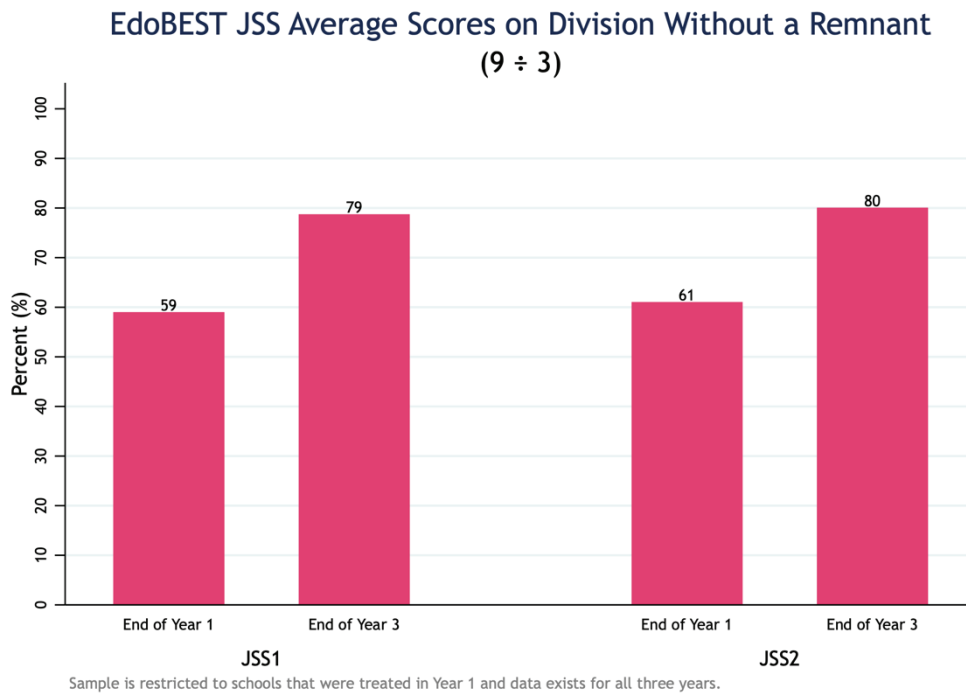


Figure 5.5

The large gains in division were mirrored in multiplication as well. In July 2022, less than half of JSS 1-2 students could solve a problem requiring multiplication with regrouping (e.g. 42x6). **By July 2024, two-thirds of students could solve this problem, with an average gain of 19 percentage points across both grades** (Figure 5.6). Similar to the outcomes in division, the average JSS 1 student in July 2024 substantially outperforms the average JSS 2 student from July 2022, with 25% (13 percentage points) more JSS 1 students able to solve this problem than JSS 2 students two years prior.

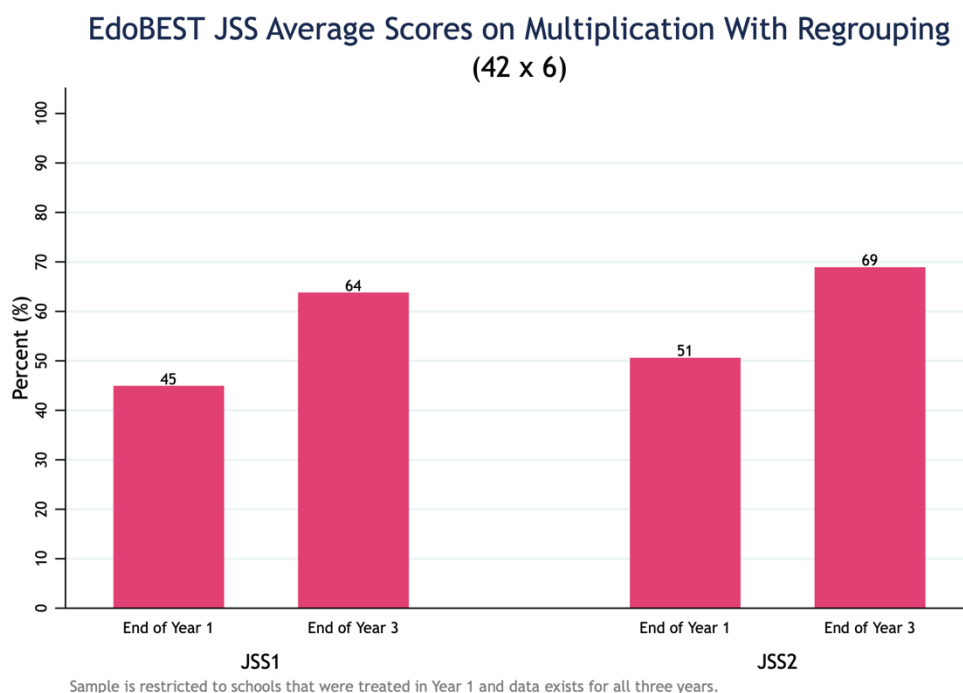


Figure 5.6

The observed improvements in operational maths problems correspond with large gains in solving word problems

Students' proficiency in solving operational maths problems (i.e. problems where only numbers are shown) is a strong indicator of their ability to solve problems that mirror real-life situations, which they are likely to encounter both in and out of school. In EdoBEST JSS schools, students not only considerably improved in solving problems in the operational sense, but also in the ability to apply those skills to real-life problems. **For instance, 66% of students in the average JSS 2 classroom can now answer a subtraction word problem (e.g. "There were 43 children in the park. Out of these, 25 of them have gone home. How many children are in the park now?"), up from 51% in July 2022 (Figure 5.7).** Students' ability to solve word problems not only evidences improvements in numerical proficiency, but also reflects the gains observed in reading comprehension as well, as students must possess a certain level of comprehension to be able to understand the contents of a word problem. Therefore, the observed improvements in solving word problems are evidence that more time spent receiving the programme's instruction translates into compounding positive results across multiple subjects.

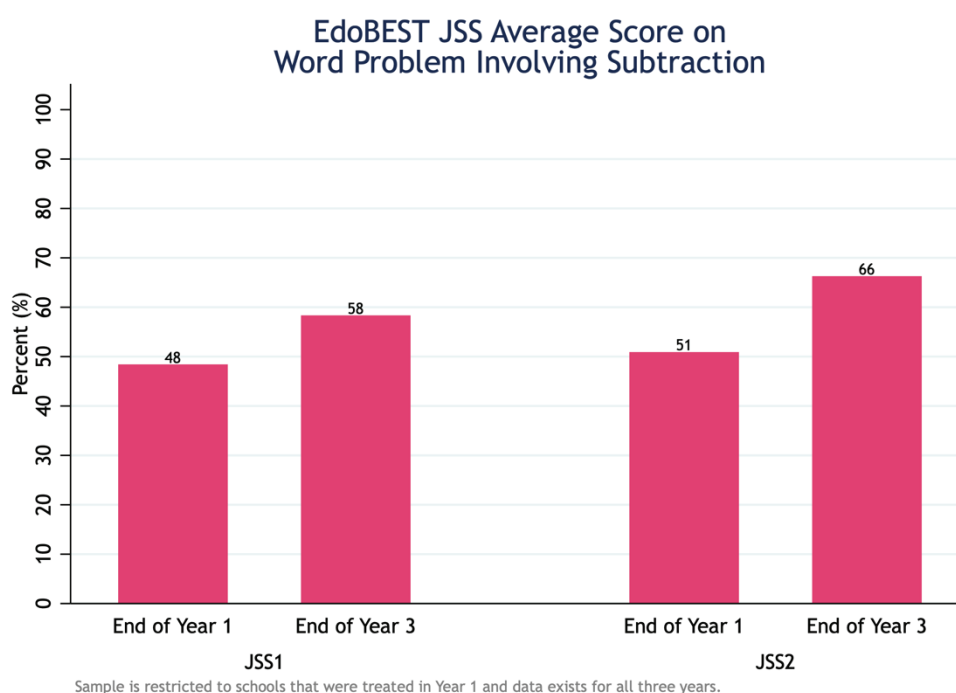


Figure 5.7

The EdoBEST programme has enabled JSS students to master foundational skills earlier in their academic careers compared to students prior to the programme's implementation. This is a meaningful achievement, indicating that the EdoBEST programme is positively impacting JSS education. Mastery of foundational mathematics skills at an earlier stage provides students with more time to engage with advanced mathematical concepts throughout their schooling, thereby expanding their potential skill sets. While this progress is encouraging, it is essential that such improvements are sustained consistently year after year for Edo State students to reach the academic levels of their international peers. The following section outlines the outcomes from the previous year and identifies key areas that require attention to ensure continued and accelerated progress.

VI. Additional Insights After Two Years of Programme Implementation

Having established the positive overall impact of the programme, it is also helpful to examine trends over time as well as any patterns of variation across subgroups. This section of the report describes year-on-year changes in learning levels and compares results across genders and regions.

Foundational Literacy

The rate of non-readers continued to drop from July 2023 to July 2024

The rate of non-readers has continued to decrease in the last year of the EdoBEST JSS. Compared to the end of the 2022-23 school year, the rate of non-readers on a JSS1-level passage is 3-4 percentage points lower as of July 2024 (Figure 6.1). For the first time in at least three school years, 95% of Edo State JSS students are able to read at least one word from a JSS1-level passage. The programme therefore has continued to support those students who need the most literacy support. A similar trend is observed when students are assessed with a grade-level passage (Figure 8 in Appendix B). Although this change is modest, it is indicative of overall progress in students' foundational reading skills.

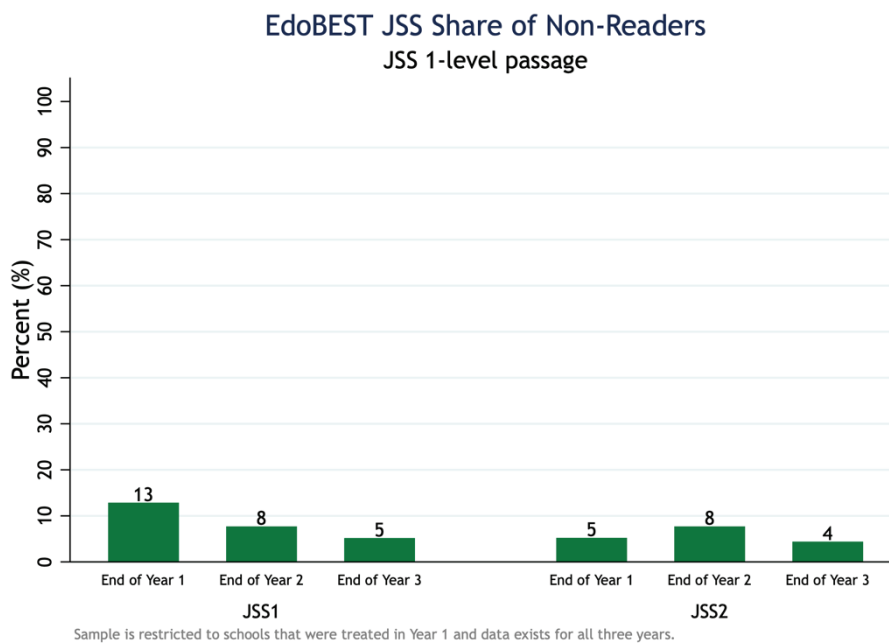


Figure 6.1



English oral reading fluency rates improved year-on-year

Oral reading fluency rates among JSS 1 and 2 students increased in the last year. On a JSS1-level passage, JSS 1 and 2 improved their fluency rates by a combined average of 4 cwpm (Figure 6.2). Although gains in JSS 1 were more modest than in the first year, the continued year-on-year improvement reflects meaningful progress in learning. As previously mentioned, DIBELS classifies students who read 124 cwpm or fewer from this passage as being at-risk for reading difficulties and being unable to achieve literacy within their lifetime (University of Oregon, 2020). **Compared to the end of the previous academic year, the percentage of JSS 1 students who fall into this 'at-risk' category has dropped by 4 percentage points, from 70% to 66%.** Therefore, while the average number of cwpm gained over the last year may appear modest, EdoBEST JSS schools are in fact providing more students with the skills they need to be proficient readers than just one year prior.

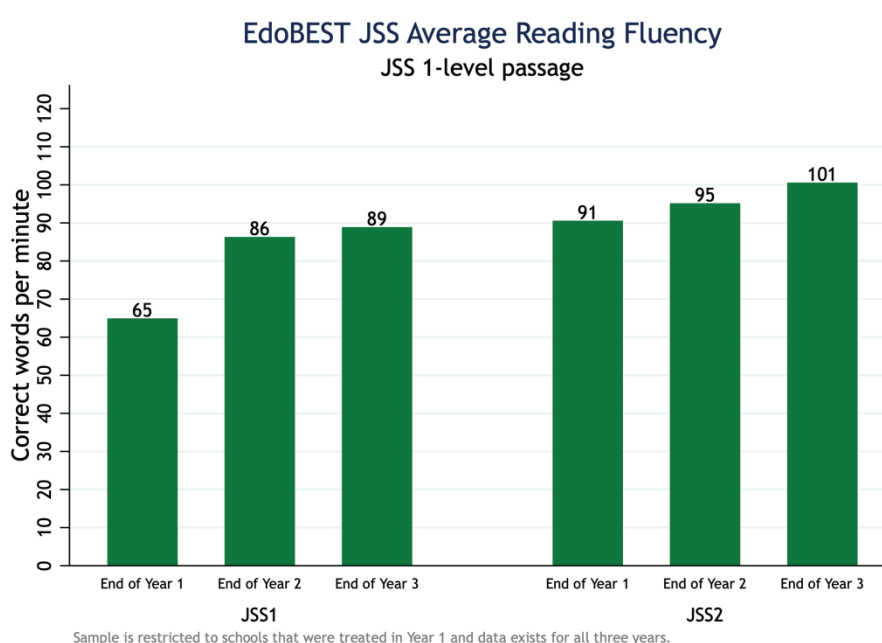


Figure 6.2

While reading fluency on a grade-level passage has increased by an average of 16 cwpm since July 2022, there was a slight decrease in fluency rates between the end of the 2022-23 and 2023-24 school years. As of the end of the 2023-24 school year, JSS 1 and 2 students read an average of 86 cwpm from their respective grade level passages when assessed, which is 3 words fewer than JSS 1 and 2 students did one year prior in July 2023 (Figure 9 in Appendix B). Nonetheless, when considered alongside the fluency rate changes on the JSS1-level passage, the data indicate that reading fluency rates among EdoBEST JSS students have increased substantially over the past two years, with modest overall improvements in the last year.

Reading comprehension scores showed initial growth, and have held steady during the last year

Despite overall gains in reading comprehension over the past two years, average scores did not improve between July 2023 and July 2024. In JSS 1, scores did not change between the end of the 2022-23 and 2023-24 school years, while in JSS 2, scores in July 2024 were 4 percentage points lower than the previous year (Figure 6.3). Scores on a grade-level passage decreased to an even greater extent, declining by 6-8 percentage points across JSS 1-2 (Figure 10 in Appendix B).

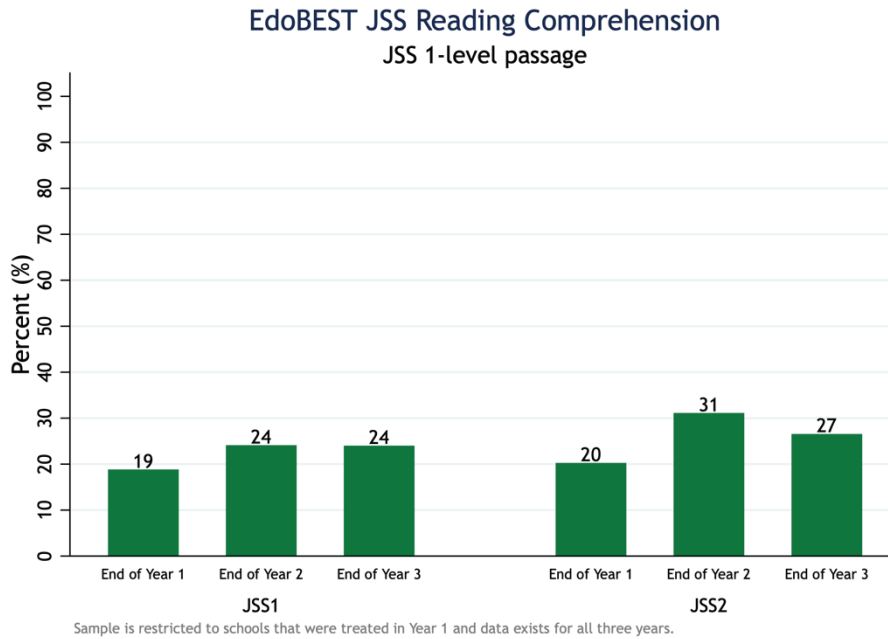


Figure 6.3

Although reading fluency rates on a JSS1-level passage improved from July 2023 to July 2024, reading comprehension rates decreased, particularly for JSS 2. In other words, while JSS 1 and 2 students in July 2024 were able to read faster than their peers could last year, they comprehended less of what they read. To better understand this discrepancy, it is useful to consider the Simple View of Reading (SVR), one of the most widely validated theories in the field of education (Snow, 2018). According to this theory, children must develop two skills in order to comprehend written text. The first skill is decoding: the ability to sound out words phonetically and eventually to recognise words on sight. The second is oral language: the ability to make sense of language (Gough and Turner, 1986; Hoover and Gough, 1990). According to this theory, these data on EdoBEST JSS reading fluency and comprehension rates suggest that instruction should concentrate on oral language skills in order to improve students’ ability to comprehend written text. For more information on the importance of foundational skills, see Box 3.



Box 3: The Value of Universal, Early, Conceptual and Procedural Mastery of Foundational Skills

Over the last few decades, educational enrolment in low- or middle-income countries (LMIC) has been catching up with the enrolment rates in high-income countries (HIC). However, international standards of literacy and numeracy indicate that the average student in LMIC performs worse than 95% of the students in HIC (World Bank, 2018). Despite these global enrolment increases, learning levels remain low because children are not mastering foundational skills like literacy and numeracy. For instance, a 2021 study conducted across 32 countries highlighted that on average, only 30% of Grade 3 students possessed foundational literacy skills, with only 18% possessing foundational numeracy skills (UNICEF, 2022).

Foundational skills are necessary to effectively advance learning, comprehension, and problem solving skills in children's future academic careers and personal lives. Lacking foundational skills in the early grades creates even larger gaps in learning in later grades, as students who did not master the foundations will have a harder time advancing through higher order concepts. This can have a negative impact on further skill development, career opportunities, and social mobility later in adulthood (Belafi et al., 2020).

To increase overall learning levels, education systems must prioritise universal, early, conceptual, and procedural mastery of foundational skills (Belafi et al., 2020). Universality ensures that learning progress is being made and measured for all children, regardless of socioeconomic status, gender, race or ethnic group, or whether the child is in school. It is also important that foundational skills are mastered in early grades, as learning gaps emerge early and widen throughout grade progression (Belafi et al., 2020). Additionally, developing both conceptual and procedural knowledge helps students cultivate a well-rounded understanding of foundational skills, which contributes to mastering the skill and being able to apply it in other contexts (Kilburn, 2020). Implementing all these components in conjunction is necessary for a more comprehensive and equitable approach to teaching and learning.

Prioritising universal, early, conceptual, and procedural mastery of foundational skills may require government intervention, curriculum reform, additional instructional support, and/or targeted remediation efforts for students falling behind (Belafi et al., 2020). To successfully implement this, reform should aim to specifically target learning outcomes instead of inputs that may influence learning, such as technology, textbooks, or teachers. For example, in 2015 Tanzania enacted the "3Rs" reform, which consisted of major curriculum reforms in Grades 1 and 2 that aimed to focus 80% of instructional time on foundational literacy and numeracy. The reform had a positive effect on both literacy and numeracy; the likelihood of a student reaching grade 2 math proficiency increased by 50%, and the likelihood of reaching grade 2 Kiswahili proficiency increased by 71% (Rodriguez-Segura & Mbiti, 2022). In this sense, realigning curricular expectations for teachers such that they would focus more heavily on foundational skills led to meaningful learning gains in the earlier grades, and will allow these students to be better prepared to learn new subjects later on.

Insufficient mastery of foundational skills has a detrimental effect on overall levels of learning, thus perpetuating an ineffective education system. To make the system more effective, governments and schools can prioritise universal, early, conceptual, and procedural mastery of foundational skills in schools' curriculum, with the goal to increase learning for a wider range of children. A system-wide commitment to prioritising foundational skills mastery in schools is a necessary step that not only lays the groundwork for future learning, but also effectively bridges nationwide and global equity gaps with more impactful educational investments.

Foundational Maths

While there has been overall improvement since July 2022, ICAN scores have also not meaningfully increased in the last full year of the programme

Since July 2022, average ICAN scores have increased from 46% to 54% across JSS 1-2. However, scores as of July 2024 are 2 percentage points lower, on average, than they were in July 2023, with minimal differences between JSS 1 and JSS 2 scores (Figure 6.4; Figure 11 in Appendix B). This pattern – an overall upwards trend, with small declines in the last year – is consistent across most subskills assessed on the ICAN, although larger declines since July 2023 were observed on more advanced problems, such as those involving division, fractions, and equations. For example, the percentage of JSS 1-2 students who successfully completed the number recognition, addition, subtraction, and multiplication sub-tasks changed by 1 percentage point or less from July 2023 to July 2024. By contrast, the percentage of students who could successfully solve problems involving division, fractions, and equations dropped by 5, 7, and 2 percentage points respectively. These findings indicate that while foundational skills in basic arithmetic remained relatively stable overall, more complex mathematical concepts posed increasing challenges for students in JSS 1 and 2 between 2023 and 2024.

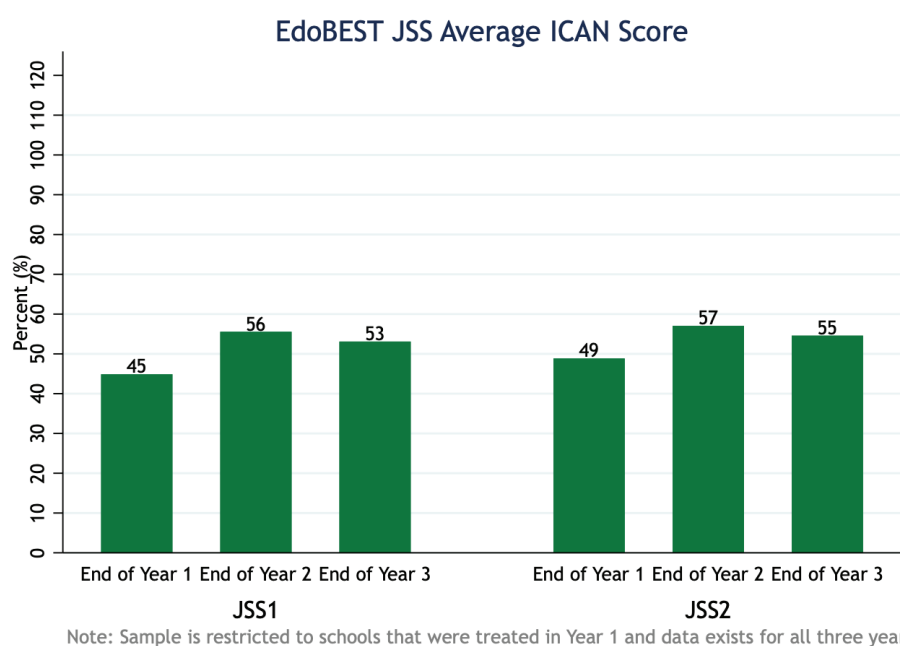


Figure 6.4

Results by Gender

Male and female JSS 1-2 students have made similarly large gains in learning outcomes, with females slightly outperforming males in both English and maths. In reading fluency, both groups showed comparable improvement on a JSS1-level passage, despite starting at different levels. On average, female students gained 22 cwpm over the last two years of implementation, while male students gained 19 cwpm (Figure 6.5). A similar pattern is observed in maths; on problems requiring two-digit addition with carrying (e.g. $56+17$), average scores among female students increased by 15 percentage points, while average scores among male students increased by 13 percentage points (Figure 6.6). Even though the differences that existed at baseline still remain, the fact that male and female students saw similar average gains across subjects confirms that the programme worked equally well for both boys and girls.

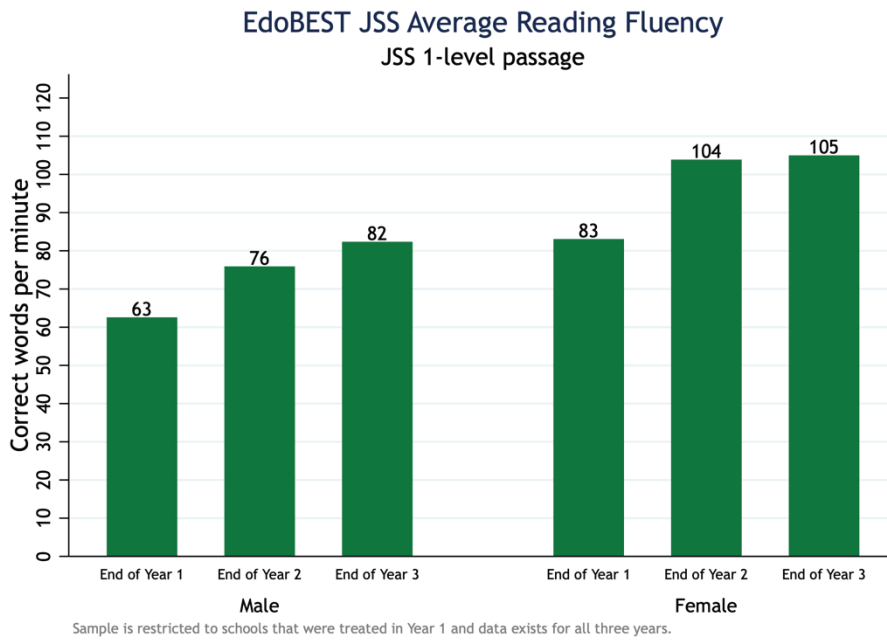


Figure 6.5

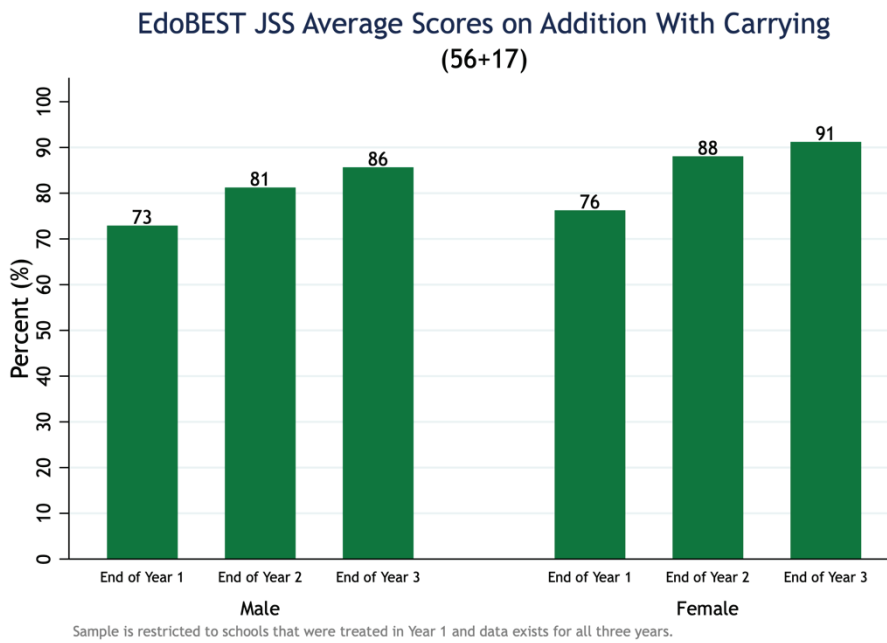


Figure 6.6

Results by Region

The impact of the programme varied across districts. On average, Edo Central and Edo North showed large improvements in English and maths, while Edo South saw little meaningful change overall.¹ In JSS 1, the largest learning gains were observed in Edo North, followed by Edo Central and Edo South. In JSS 2, the largest gains were seen in Edo Central, followed by Edo North and then Edo South. Given these results, it will be important to further investigate implementation and outcomes by region – and specifically in Edo South, the lowest-performing district – to ensure that all districts are implementing the programme with equal fidelity, so that all students have equitable learning opportunities.

Table 6.1: EdoBEST JSS Growth from End of Year 1 to End of Year 3, by District

Subskill		Grade	Edo Central	Edo North	Edo South
Reading Fluency (Correct words per minute)	JSS1-level passage	JSS 1	15.5	38.3	16.1
		JSS 2	22.6	15.7	-3.5
	Grade-level passage	JSS 1	-0.4	15.3	-0.9
		JSS 2	13.2	14.0	-6.2
Reading Comprehension (Percentage points)	JSS1-level passage	JSS 1	12.5	29.2	5.2
		JSS 2	27.8	-18.9	5.9
	Grade-level passage	JSS 1	0.6	11.2	-11.3
		JSS 2	19.5	16.4	-1.2
Average ICAN Score (Percentage points)		JSS 1	13.3	11.0	0.9
		JSS 2	9.3	9.3	-0.2

¹ While there are some outliers in certain grades or subskills in Edo Central and Edo North, these observations likely reflect random variation in the data rather than actual differences in performance.

Measures of Instructional Quantity

Teacher attendance rates remained consistently high throughout the school year

Compared to the 2022-23 school year, teacher attendance rates were impressively high in 2023-24. In 2022-23, the average teacher attendance rate was 76%. In 2023-24, the average teacher attendance rate across all EdoBEST JSS schools never dropped below 82% (Figure 6.7). These consistently high rates indicate that EdoBEST JSS teachers are committed to providing high-quality education. These higher attendance rates also directly translate to students receiving more instruction every week. Moving forward, the EdoBEST JSS programme will strive to maintain these high rates of attendance.

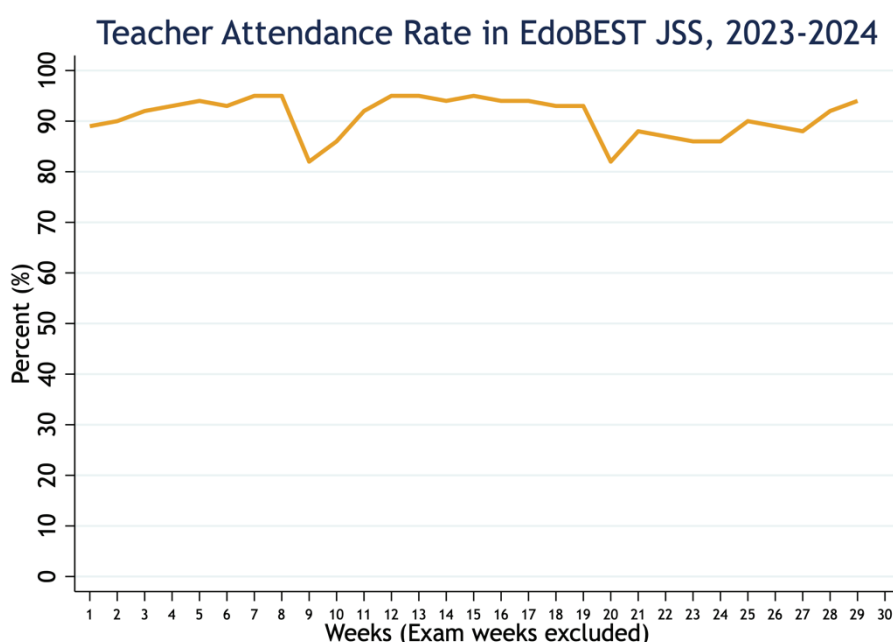


Figure 6.7

Student attendance and lesson completion rates remained consistent

In the 2023-24 school year, student attendance and lesson completion rates averaged 61% and 62% respectively, with minimal change occurring from term to term (Figure 6.8 & 6.9).² In other words, the average EdoBEST JSS student attended school three days a week, and teachers only completed three out of every five scheduled lessons. Therefore, there is room for improvement in both student attendance and lesson completion rates. Improvements in both of these metrics would lead to students receiving more high-quality instruction and content.

² As a note, Weeks 11 and 20 corresponded to the first weeks of Terms 2 and 3, when attendance is typically lower.

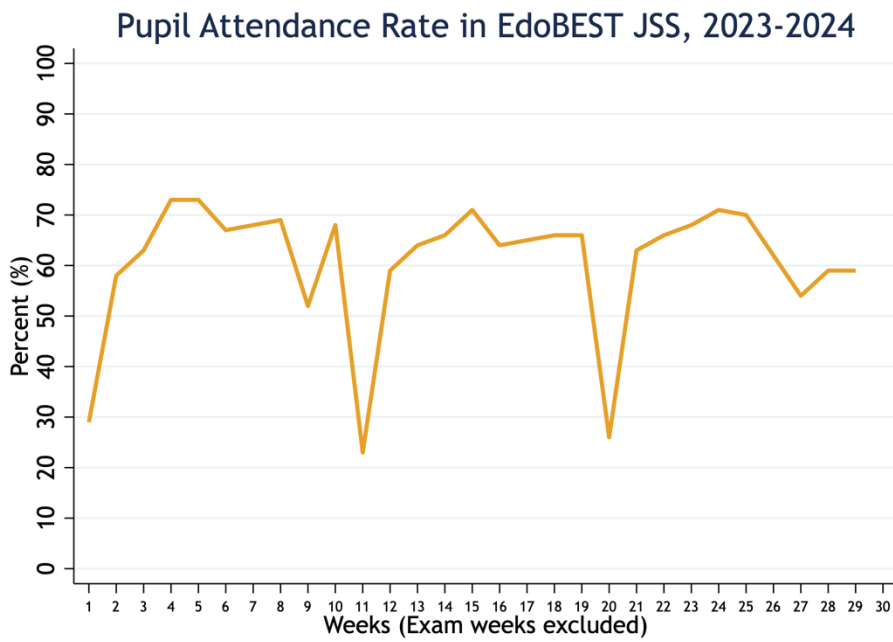


Figure 6.8

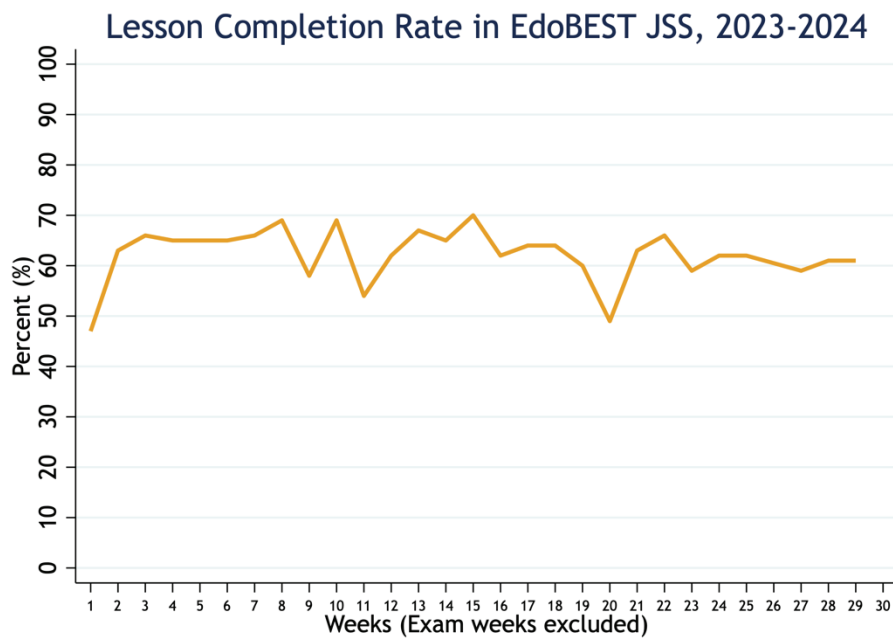


Figure 6.9

VII. Lessons Learned and Recommendations for Future Improvements

After over two years in JSS, the EdoBEST programme has gained momentum in transforming the educational landscape within Edo State, effectively adapting its approach to meet the specific needs of both students and school staff. In turn, the quality of instruction and student learning outcomes continue to improve year-on-year. During the 2023-24 school year, the second full year of the EdoBEST JSS programme, teacher attendance rates remained consistently high, never dropping below an average of 80% weekly. As a result, students have made tremendous strides in foundational literacy and numeracy. Since July 2022, oral fluency rates among JSS 1 and 2 students have increased by 22 cwpm on average, the rate of non-readers has been cut in half, and ICAN scores have increased by 7 percentage points. These findings, among other improvements, demonstrate the continued positive impact of the EdoBEST programme as it continues to mature.

Despite the improvements observed by the end of the 2023-24 school year, more work is required in order to foster progress in the coming years. For instance, reading comprehension rates and maths proficiency levels (particularly on slightly more advanced skills such as division, fractions, and equations) have both declined in the last full year of the programme being implemented. Therefore, for the 2024-25 school year and beyond, the EdoBEST JSS programme is working to improve both lesson completion and student attendance rates. By maintaining high fidelity of implementation and consistent instructional delivery, EdoBEST can help ensure that students are in school and receiving high-quality lessons each day – both of which are essential for strengthening learning outcomes in the years ahead.

Strengthening of Day-to-Day Programme Implementation

During this evaluation period, EdoBEST JSS made significant strides towards improving the operational efficiency and the implementation of the programme. More teachers and students were in attendance, and the percentage of teachers delivering lessons each day has improved over time. This achievement reflects a unique combination of dedicated field teams and school leadership driving operational excellence, and the use of dynamic and actionable data (via the Spotlight app) to shine a light on key areas of growth at the student, teacher, school, or programme level. However, more work remains to be done. In spite of this progress, there is still significant room for improvement in terms of day-to-day programme implementation. Both lesson completion rates and student attendance rates held at an average of approximately 61% throughout the school year, inherently limiting the amount of instruction students are able to receive.

Improving fidelity of implementation of the programme itself is the single most important lever to improve learning during future years. Improving teacher attendance results in more classrooms with a trained teacher leading instruction each day. Improving lesson delivery leads to more productive learning time informed by high-quality teacher guides and printed learning materials. Improving student attendance means that there are more students present to benefit from these impactful lessons. By investing in these three areas – alongside other key operational areas like ensuring textbook availability and usage – the programme can ensure more productive learning time in schools and improve the learning experience of students.

Looking Ahead

The impressive progress of the EdoBEST JSS programme since its launch in 2022 has validated the ongoing investments made by Edo State in transforming its education system. The evidence in this report confirms that children and youth who have not yet received high-quality education can quickly and significantly advance their learning when provided with the proper support. The data obtained during the course of this study provide strong signals of educational success to come as the EdoBEST JSS programme matures.

Despite the improvements observed by the end of the 2023-24 school year, more work is required in order to sustain these positive trends – and build upon them – in the coming years of the programme. As a data-driven programme, EdoBEST JSS will continue to conduct similar large-scale, rigorous evaluations for the upcoming school years as well. These rounds of data collection will give the Edo State Government further insights into the impact of the programme: what is going well, and what needs to be strengthened. Continued investments to improve programme implementation – if done correctly – will drastically improve the quality of teaching and learning across the state.

The EdoBEST JSS programme is a bold, highly impactful investment, designed to provide children across Edo State with high-quality education. This large-scale system-wide transformation has led to large, positive impacts on literacy and numeracy outcomes. Through its EdoBEST programme, Edo State will continue to provide rich, nurturing learning environments across the Edo State, where students of all backgrounds will have the unprecedented opportunity to actually learn in school and thrive academically.



VIII. Appendix

Appendix A: Learning Assessments

Literacy assessments

DIBELS JSS1-level passage (All students)

Changing Bedtime

Tensions are running high in the Groff home as talks on summer bedtime rules continue. The household is evenly divided into two camps. So far, there is no sign that either side will surrender.

At eight o'clock this evening, the younger Groffs, Ben and Lu, brought their demands to their parents. It appears they had been organizing for some time and were prepared for a fight. They asked for a later bedtime. They said they ought to be allowed to stay up until ten o'clock in the summer. In support of their request, they pointed to the facts that they have no school in the morning and that it doesn't get dark until late in the summer. They also said that everyone else gets to stay up late and it's not fair.

Their parents responded by offering an eight-thirty bedtime. This would be a half hour gain for the younger Groffs. The younger Groffs rejected this offer. They declared it so far below their original request as to be insulting. The mother of the Groff family gave a speech about the need of growing bodies for proper sleep. The father made a statement about the parents' need to not have kids running around all night. The younger Groffs characterized the mother's speech as dumb. It was typical of their style, they claimed. They disapproved the father's words, calling them irrational, depicting events that would never happen.

The issue remains unresolved. The younger Groffs' skill at arguing could keep them out of bed until their desired bedtime. Should this occur, they could then claim they had been allowed to stay up late before, and so they should be allowed to stay up late again. If their parents can be convinced that a later bedtime has not caused a loss in quality behavior, they might back down. However, another possibility is that their parents are used to stalling tactics and will not be moved by them.

Comprehension Questions

1. How did the parents respond to Ben and Lu's proposal for a 10:00 summer bedtime?
2. Why are tensions running high in the Groff home?

JSS 1 grade-level NERDC passage

Fluency Assessment: Oral Reading Fluency

PROBE

Grade 7

Automobiles

An automobile (also called autocar, motor car or car) is a wheeled motor vehicle used for transporting passengers, which also carries its own engine or motor. Automobiles are designed to run primarily on roads, to have seating for one to eight people, typically to have four wheels and to be constructed principally for carrying people rather than goods.

The word automobile comes from the French word automobile from the Ancient Greek word autos (self) and the Latin mobilis (movable): meaning a vehicle that moves. The alternative name car is believed to originate from the Latin word carrus (wheeled vehicle) or the Middle English word carre (cart).

Most automobiles in use today are propelled by an internal combustion engine, fuelled by deflagration of gasoline (petrol) or diesel. Both fuels are known to cause air pollution and are blamed for contributing to climate change.

How does a car work? When a driver turns a key in the ignition, the car battery sends power to the starter motor which turns the crankshaft, which gets the pistons moving, and then the engine fires up and ticks over. A fan draws air into the engine through an air filter. The air filter removes dirt and grit from the air which is drawn into a chamber where fuel (petrol or diesel) is added.

This fuel-air mix (a vapourised gas) is stored in the chamber. When the driver presses the accelerator pedal, the throttle valve is opened. The fuel-air mix passes through an intake manifold and is distributed, through intake valves, into the cylinders.

Comprehension Questions

1. What machine part propels most automobiles?
2. Why don't we consider a train to be an 'automobile'?

JSS 2 grade-level NERDC passage

Fluency Assessment: Oral Reading Fluency

PROBE

Grade 8

Cooperation

What does cooperation really mean? It means carrying out any piece of work or duty assigned to you willingly, promptly, and efficiently without being forced. When you obey the rules and regulations of a group or society, when you pay your taxes voluntarily, etc. you are said to be cooperating.

Cooperation starts from the home, within the family unit. Each member of the family has to cooperate so as to achieve the goal of the family. If there is a lack of cooperation in the family, the father and the mother will be going in opposite directions while the children will go in another direction. This will have adverse effects on each member of the family.

Let us again look at a football team – whether male or female. Many matches that could have been won have been lost because of lack of cooperation among members. The individual player wants to play to the admiration of the spectators. He wants to ‘shine’, to take the glory of scoring the goal single-handedly. But a tree does not make a forest. The team therefore ends up being defeated. When, however, each member of the team realised that if the match is won all members will be praised, he is fully determined and committed to the team. He cooperates with other members and eventually the match is won.

In the larger society, there is the need for cooperation to ensure the smooth running of the society. Cooperation comes in form of paying taxes without being coerced, obeying the laws of the society voluntarily and seeking the good and the advancement of the society. When the individual carries out his or her assignment in the society, it will be observed that such a society will enjoy peace, progress and prosperity. If a person lives in a society and fails to cooperate, such a person will be considered as a misfit.

What about the school setting? For the school to achieve its purpose of existence, there must be cooperation. A student who does not cooperate with the school authorities will have himself or herself to blame. The student will end up with a woeful performance in his or her examinations. That reminds me of a popular saying of my former Principal. He used to say that the school authority is a stone while the student is an egg. If the egg rolls to the stone, the egg will break, if the stone rolls to the egg, the egg will break. The egg therefore has to watch it.

Comprehension Questions:

1. According to the passage, where does cooperation start?
2. Is being forced to give money to your community an example of cooperation? Why or why not?

JSS 3 grade-level NERDC passage

⊕

Fluency Assessment: Oral Reading Fluency
PROBE
Grade 9

Inflation

Inflation is the rise in general level of prices of goods and services in an economy over a period of time. When the general price level rises, each unit of currency buys fewer goods and services. Consequently, there is an erosion in the purchasing power of money – a loss of real value of the currency within the country.

Inflation's effects on an economy are various and can be simultaneously positive and negative. Negative effects of inflation include increased risk in saving, uncertainty over the future which may discourage investment and savings, and, if inflation is rapid enough, shortages of goods as consumers begin hoarding out of concern that prices will increase in the future. Positive effects include ensuring that central banks can adjust real interest rates (intended to reduce the harmful effect of recessions) and encouraging investment in non-monetary capital projects.

Some of the negative effects of inflation could have serious impact not only on the economy, but also on the social welfare of society at large. High inflation can prompt employees to demand rapid wage or salary increases, to keep up with consumer prices. Rising wages in turn can help fuel inflation. In other words, inflation causes further inflationary expectation, which causes further inflation. This is called cost-push inflation in economics. Moreover, inflation can encourage hoarding. In this situation, people buy durable and / or non-perishable commodities and other goods to store them in the house in order to avoid the losses expected from the declining purchasing power of money, which in turn creates shortages of the hoarded goods.

Inflation can lead to social unrest, public demonstration and revolutions. For example, inflation, and in particular food inflation, is considered one of the main reasons that caused the 2010-2011 Tunisia revolution and the 2011 Egyptian revolution. Tunisian president Zine El Abidine Ben Ali was ousted. Egyptian president Hosni Mubarak was also ousted after eighteen days of demonstrations and protests which eventually spread to many countries of North Africa and the Middle East.

Comprehension Questions:

1. What happens to the buying power of currency when the general price level rises?
2. During periods of inflation, many people begin hoarding goods. Why does this happen?

Mathematics assessment

International Common Assessment of Numeracy Plus (ICAN+)

Number recognition	Addition	Subtraction	Multiplication	Division
<p>Task 1 - Recognise numbers.</p> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px;">3</div> <div style="border: 1px solid black; padding: 2px;">8</div> <div style="border: 1px solid black; padding: 2px;">2</div> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div style="border: 1px solid black; padding: 2px;">0</div> <div style="border: 1px solid black; padding: 2px;">9</div> </div> <p>At least 4 out of 5 numbers must be correct</p>	<p>Task 1</p> $\begin{array}{r} 32 \\ + 15 \\ \hline \end{array}$	<p>Task 1</p> $\begin{array}{r} 46 \\ - 21 \\ \hline \end{array}$	<p>Task 1</p> $2 \times 4 =$	<p>Task 1</p> $9 \div 3 =$
<p>Task 2 - Recognise numbers.</p> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px;">48</div> <div style="border: 1px solid black; padding: 2px;">84</div> <div style="border: 1px solid black; padding: 2px;">22</div> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div style="border: 1px solid black; padding: 2px;">97</div> <div style="border: 1px solid black; padding: 2px;">30</div> </div> <p>At least 4 out of 5 numbers must be correct</p>	<p>Task 2</p> $\begin{array}{r} 56 \\ + 17 \\ \hline \end{array}$	<p>Task 2</p> $\begin{array}{r} 78 \\ - 29 \\ \hline \end{array}$	<p>Task 2</p> $\begin{array}{r} 42 \\ \times 6 \\ \hline \end{array}$	<p>Task 2</p> $7 \overline{)93}$
Word problem				
<p>Task 2a - Subtraction - Listen to the question carefully, solve and answer.</p> <p>There were 43 children in the park. Out of these, 25 of them have gone home. How many children are left in the park now?</p>	<p>Task 2b - Division - Listen to the question carefully, solve and answer.</p> <p>A shopkeeper has 48 apples. He keeps 3 apples in each box. How many such boxes will he need to keep all the apples?</p>			
ICAN assessment tasks				
		Fractions		Equations
		<p>Task 1 - Which is greater:</p> $\frac{4}{5}$ or $\frac{3}{15}$	<p>Task 1</p> $17x = 68 \quad x =$	
		<p>Task 2</p> $1\frac{1}{6} + \frac{1}{3} =$	<p>Task 2</p> $-5y - 3 = 12 \quad y =$	
Word problem				
<p>Task 2c - Fractions</p> <p>There were 108 goats in the pen. $\frac{1}{6}$ of them were black. How many goats were NOT black?</p>		<p>Task 2d - Equations</p> <p>A number plus 8 equals $\sqrt{144}$. What is the number?</p>		

Appendix B: Additional Figures

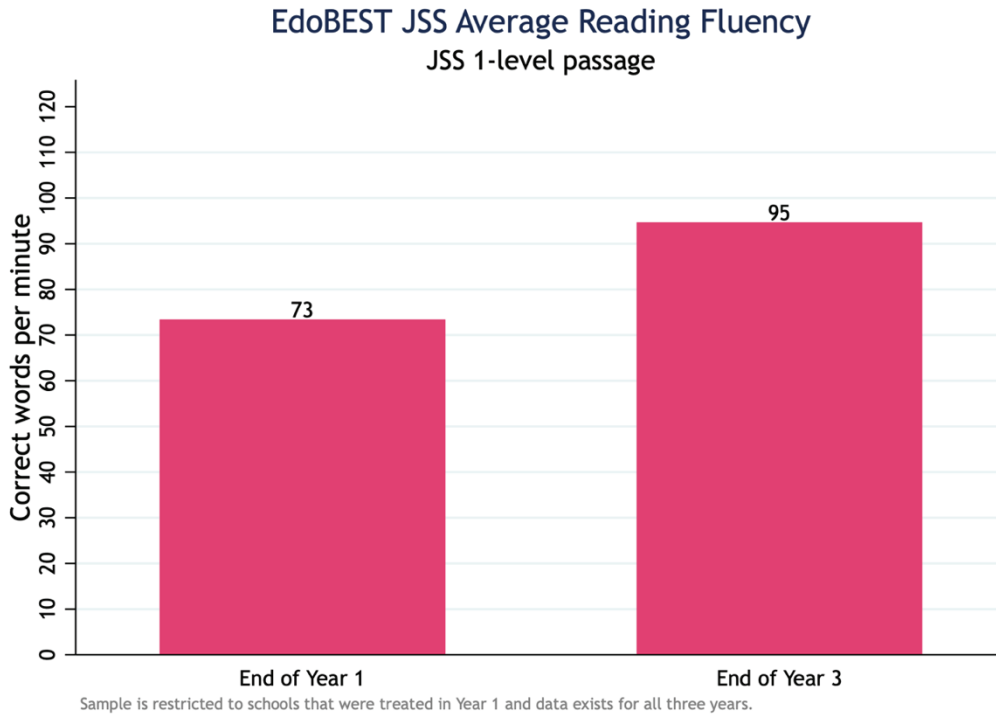


Figure 1

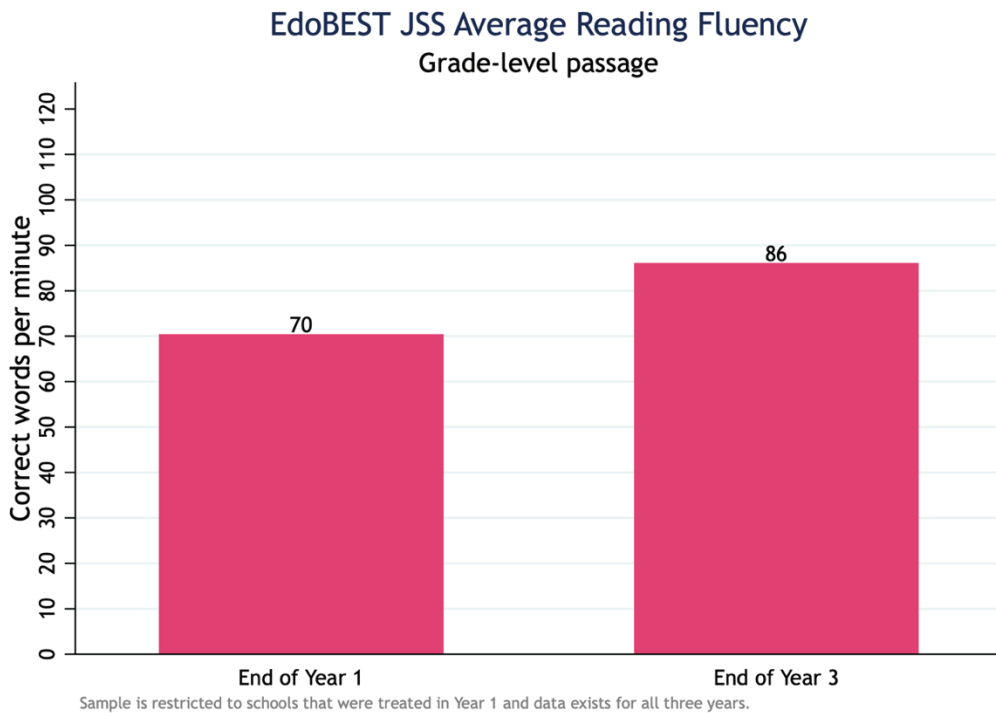


Figure 2

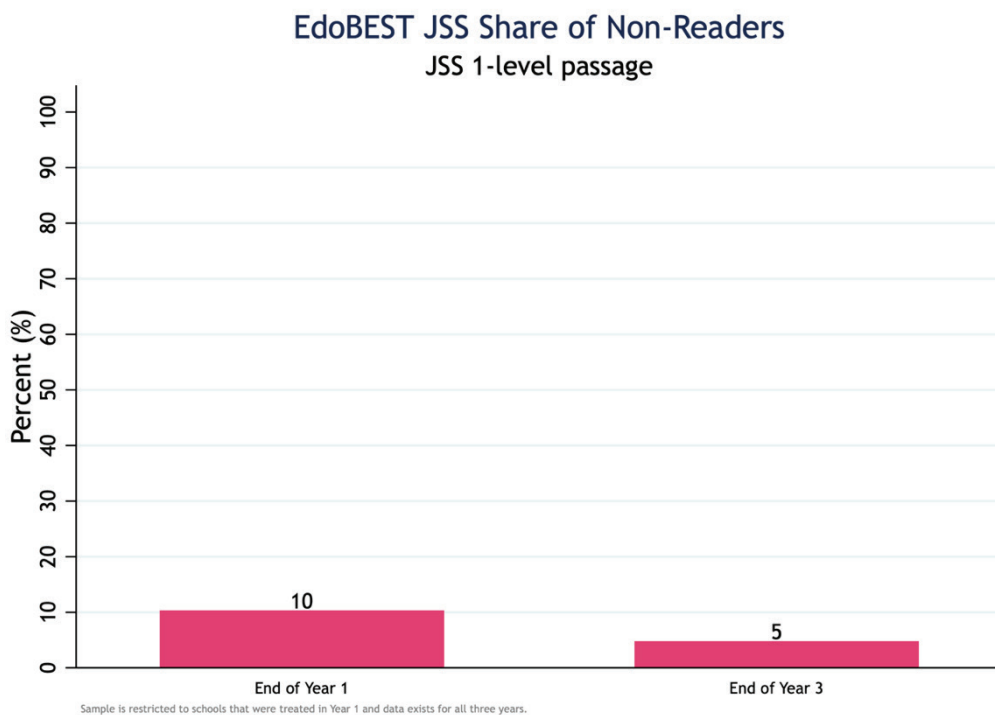


Figure 3

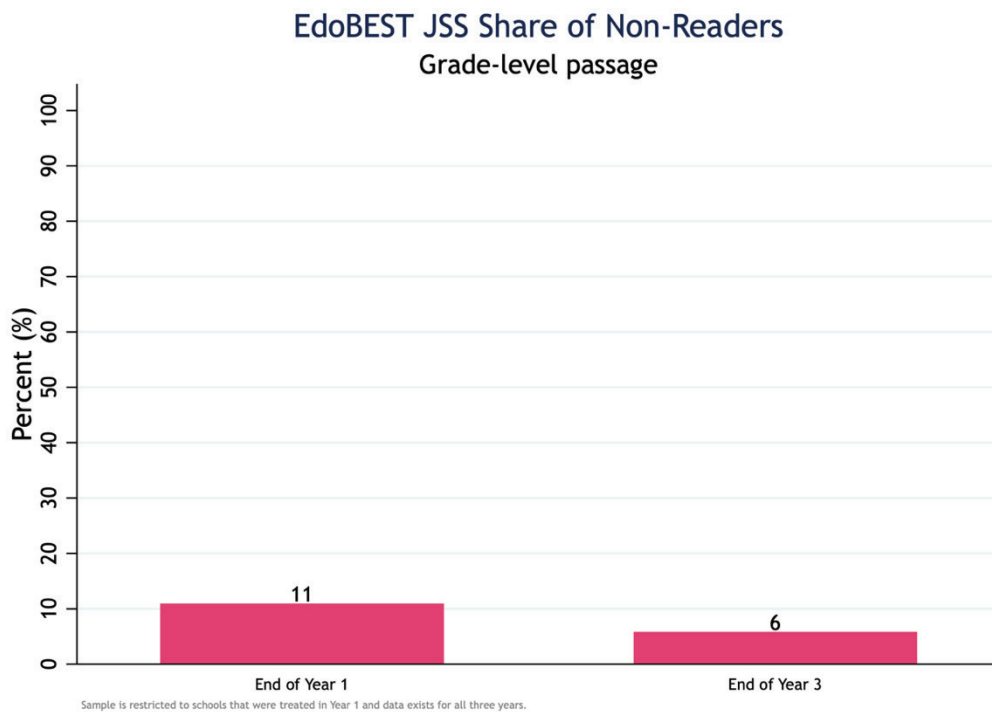


Figure 4

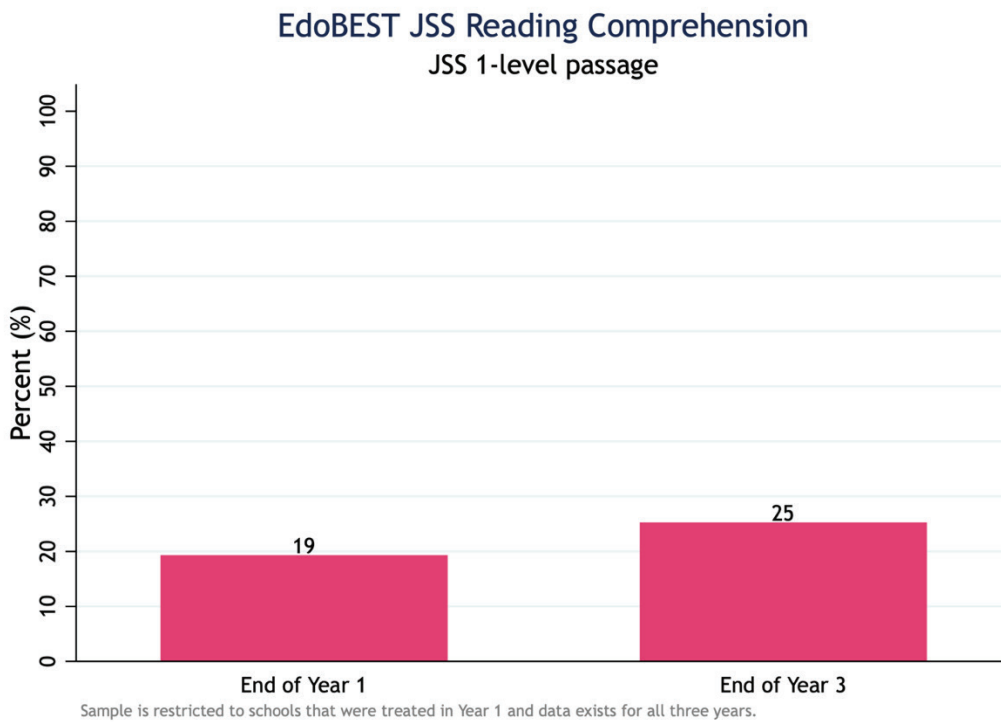


Figure 5

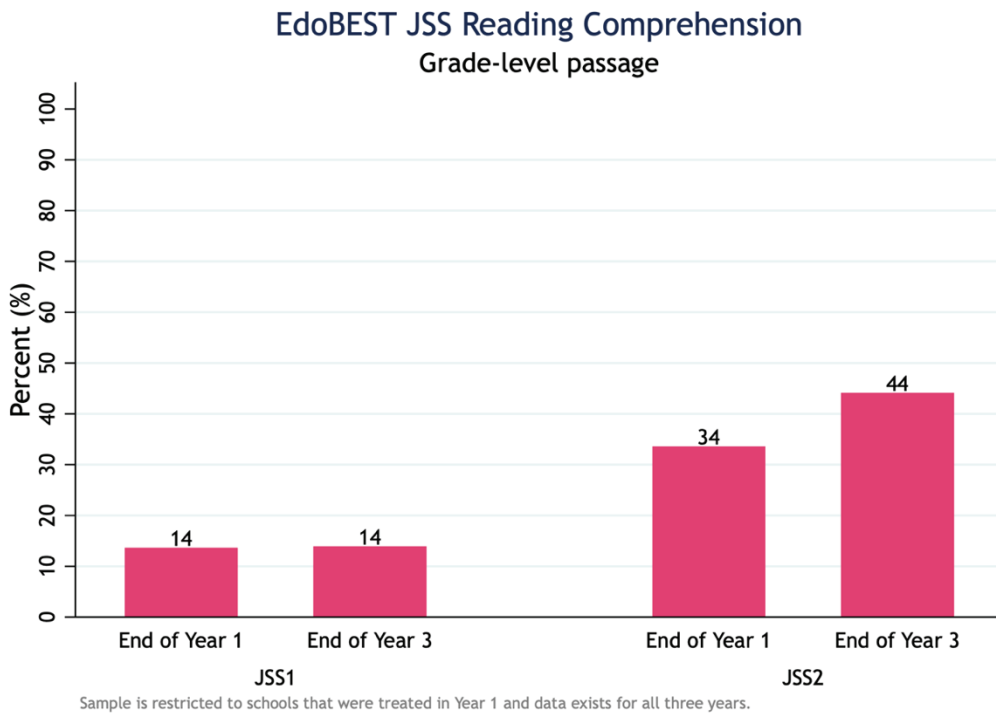


Figure 6

EdoBEST JSS Average Scores on Division With a Remnant (93 ÷ 7)

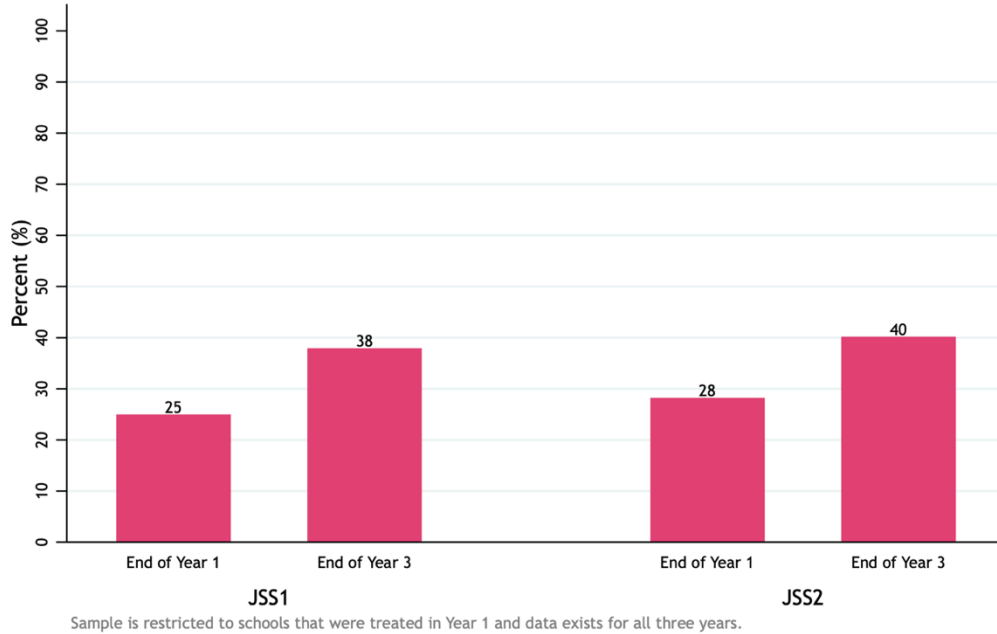


Figure 7

EdoBEST JSS Share of Non-Readers Grade-level passage

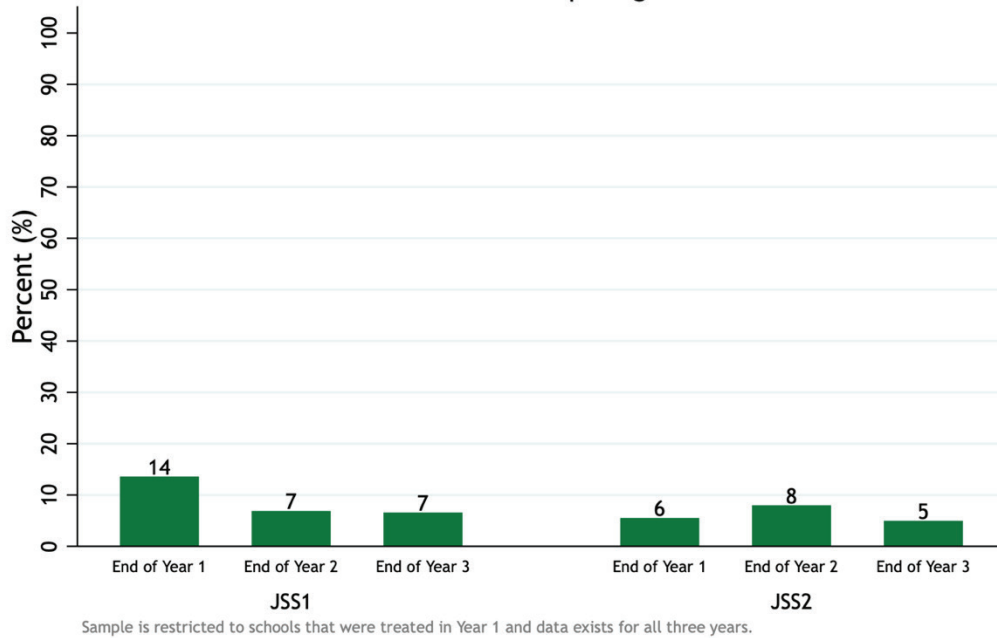


Figure 8

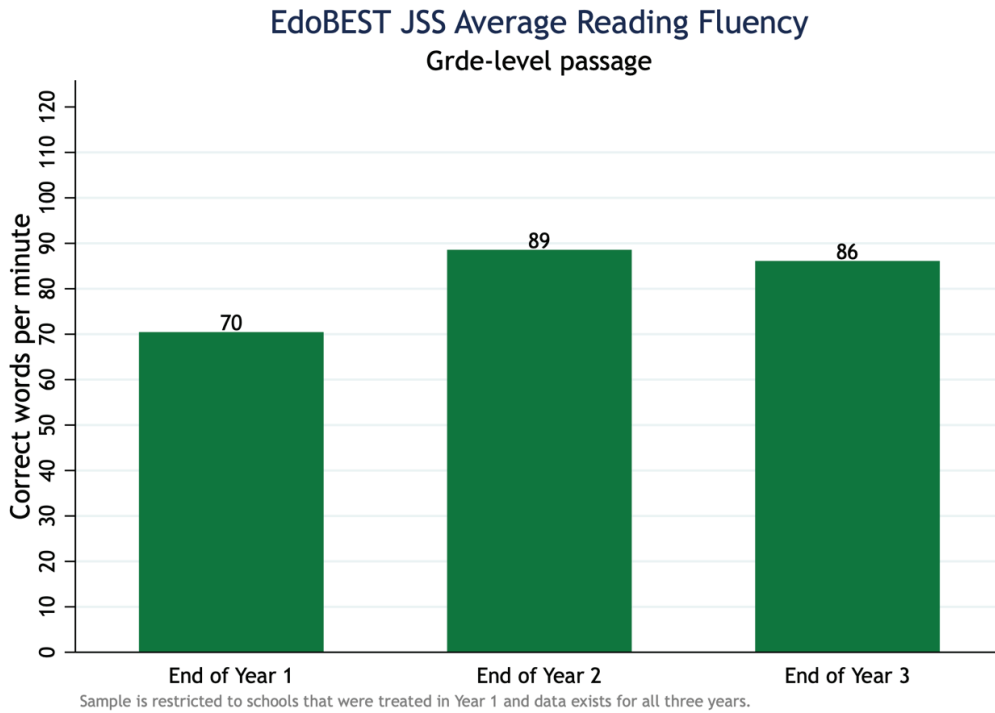


Figure 9

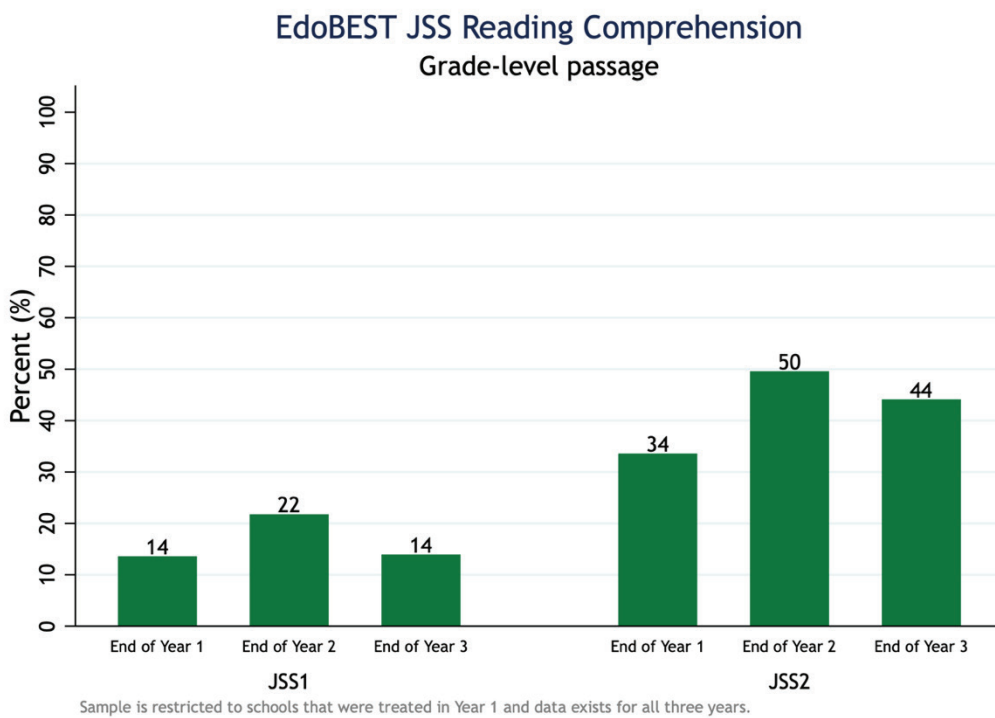


Figure 10

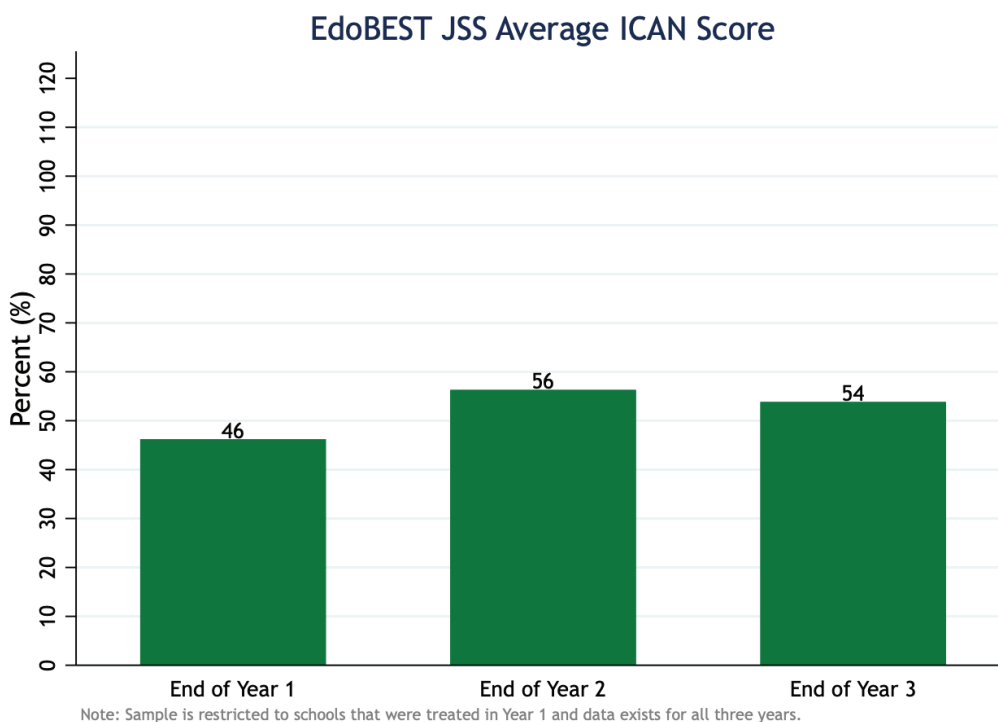


Figure 11

Appendix C: DIBELS Oral Reading Fluency Benchmarks

DIBELS (Dynamic Indicators of Basic Early Literacy Skills) is an internationally recognised assessment tool used to assess students' foundational literacy skills, including phonics, phonemic awareness, fluency, and reading comprehension. It serves to assess students' reading fluency and proficiency in relation to their academic progression. The chart below presents the DIBELS Oral Reading Fluency benchmarks, measured in Correct Words Per Minute (CWPM), for each grade level at the beginning (B), middle (M), and end (E) of the school year. These benchmarks are established based on comprehensive research examining the correlation between students' performance and their future reading development.

The scores in **blue** are an **ambitious threshold**, which classifies students as being at negligible risk for not meeting reading proficiency goals.

The scores in **green**, referred to as **benchmark scores**, can be used to classify students who are meeting expectations. 80% of students who meet this benchmark are adequately supported by general, grade-level curriculum, and are at minimal risk for failing to develop literacy skills. Students falling between the **green** and **red** cut-scores are at some risk for not meeting proficiency goals, and are in need of *strategic support*.

The benchmark in **red** is referred to as the **risk cut-score**, as it can be used to classify students who are at high risk for reading difficulties. Approximately 80% of students who fall into this category require *intensive support* in order to develop literacy skills.

JSS 1 Oral Fluency Benchmarks (CWPM)			JSS 2 Oral Fluency Benchmarks (CWPM)		
B	M	E	B	M	E
152+	161+	164+	142+	156+	159+
126	136	141	125	131	135
100	120	126	109	115	120



Appendix D: Mapping ICAN Results Onto Global Performance Standards

Mastery of numeracy skills in the early grades plays a crucial role in a student’s ability to form a strong academic foundation, which then contributes to the individual’s opportunities for economic, social, and personal prosperity. Yet, despite its importance, it is often the case that students are performing far below expectations in mathematics. In fact, a third of the global population of students will complete their Primary school education without mastery of foundational numeracy (Sitabkhan and Platas, 2018). Therefore, it is important for policymakers to have visibility into student numeracy progress and to understand the amount of growth needed for students to achieve mastery of grade-appropriate skills before the end of their schooling careers. For this, researchers need an international performance standard which aggregates data on student competencies from a broad array of contexts so that student numeracy levels can be benchmarked against globally representative expectations and the actual performance of other contexts.

The Global Proficiency Framework (GPF) is a context-agnostic compilation of numeracy proficiency descriptors developed by the UNESCO Institute for Statistics and myriad contributing organisations. The “Global Proficiency Descriptors” (GPD) included in it leverage mathematics performance data collated from fifty countries to form a standardised definition of grade-appropriate numeracy skills. Mathematical competencies that may be demonstrated by students at a particular grade level, but exceed expectations for that grade level, are categorised as such, and underperformance is likewise attributed accordingly (UNESCO Institute for Statistics et al., 2023). As such, policymakers are granted the comprehensive insight necessary to manage expectations and implement a gradational approach to elevating student success in their particular education system. Furthermore, the GPF is recognised as the source material for tracking learning progression in alignment with Sustainable Development Goal 4, which underpins its utility for translating within-system mathematical proficiency analysis to effective policy decisions (UNESCO Institute for Statistics et al., 2023).

Given the prominence of the GPF to understand global numeracy standards, this study has created a crosswalk between each skill assessed via the International Common Assessment of Numeracy (ICAN), described in this report, and the grade in which children are expected to master that skill according to the GPF. The study team carefully identified the mathematical benchmarks in the GPF that most closely correspond with assessment items, based on both the exact problem and the skill that is assessed by each problem. The grade level at which assessed students should be reaching these benchmarks was then determined by referencing the grade level(s) described under the framework’s “Meets Global Minimum Proficiency”³ threshold. In the following table, the precise alignment between each assessed ICAN skill and the grade-level expectation, per the GPF, for sufficient ability to demonstrate this skill can be found:

³ By design, this threshold is formed from a lenient definition of the level of proficiency students need to demonstrate the skill. Therefore, if an ICAN skill is assessed by a problem that is marginally more advanced than the corresponding GPD on the GPF, it is still reasonable to state that students would achieve this skill by the grade level designated by the GPD. Since the GPD describes the minimum level of skill a student can demonstrate that is still considered sufficient, it is likely that a significant proportion of students at this grade level would have stronger proficiency.

ICAN Skill	Sample Problem	GPF Grade-Level Expectation	Rationale ⁴
Simple number recognition: One-digit number recognition	3, 0, 8, 2, 9	KG	G1: N1.1.1_M Count in whole numbers up to 30.
Complex number recognition: Two-digit number recognition	48, 97, 84, 22, 30	G1-2	G1: N1.1.1_M Count in whole numbers up to 30. G2: N1.1.1_M Count in whole numbers up to 100.
Simple addition: Two-digit addition without carrying	$32 + 15 = \underline{\quad}$	G2-3	G2: N1.3.1_M Add and subtract within 20 (i.e., where the sum or minuend does not surpass 20), and represent these operations with objects, pictures, or symbols. G3: N1.3.1_M Demonstrate fluency with addition and subtraction within 20 and add and subtract within 100 (i.e., where the sum or minuend does not surpass 100), with and without regrouping, and represent these operations with objects, pictures, or symbols (e.g., $32 + 59$; solve an addition or subtraction problem presented by images of bundles of tens and ones; use number lines or skips on a hundreds grid to reason through or solve addition and subtraction problems).
Complex addition: Two-digit addition with carrying	$56 + 17 = \underline{\quad}$	G3	G3: N1.3.1_M Demonstrate fluency with addition and subtraction within 20 and add and subtract within 100 (i.e., where the sum or minuend does not surpass 100), with and without regrouping, and represent these operations with objects, pictures, or symbols (e.g., $32 + 59$; solve an addition or subtraction problem presented by images of bundles of tens and ones; use number lines or skips on a hundreds grid to reason through or solve addition and subtraction problems).
Simple subtraction: Two-digit subtraction without borrowing	$46 - 21 = \underline{\quad}$	G2	G2: N1.3.1_M Add and subtract within 20 (i.e., where the sum or minuend does not surpass 20), and represent these operations with objects, pictures, or symbols.
Complex subtraction: Two-digit subtraction with borrowing	$78 - 29 = \underline{\quad}$	G3	G3: N1.3.1_M Demonstrate fluency with addition and subtraction within 20 and add and subtract within 100 (i.e., where the sum or minuend does not surpass 100), with and without regrouping, and represent these operations with objects, pictures, or symbols.
Simple multiplication: One-digit multiplication without regrouping (exact multiplication)	$2 \times 4 = \underline{\quad}$	G3	G3: N1.3.2_M Multiply and divide within 100 (i.e., up to 10×10 and $100 \div 10$, without a remainder), and represent these operations with objects, pictures, or symbols.
Complex multiplication: Two-digit multiplication with regrouping	$42 \times 6 = \underline{\quad}$	G5	G5: N1.3.2_M Multiply, with and without regrouping, and divide, with no remainder, any number by a one-digit number and multiply two, 2-digit numbers, with and without regrouping (e.g., $342 \times 4 = \underline{\quad}$; $42 \times 34 = \underline{\quad}$; $1380 \div 5 = \underline{\quad}$).
Simple division: Exact, one-digit short division with no remnant	$9 \div 3 = \underline{\quad}$	G3	G3: N1.3.2_M Multiply and divide within 100 (i.e., up to 10×10 and $100 \div 10$, without a remainder), and represent these operations with objects, pictures, or symbols.

⁴ The Global Proficiency Descriptors for each grade level are coded in accordance with which domain and where in the GPF they are located ("N" stands for "Number Operations" and "A" stands for "Algebra"). The "M" at the end of each descriptor's label indicates that this is the expectation for the "Meets Minimum Proficiency" level.

ICAN Skill	Sample Problem	GPF Grade-Level Expectation	Rationale ⁴
Complex division: Short division of a two-digit dividend by a one-digit divisor with a remnant	$93 \div 7 = \underline{\quad}$	G6	G6: N1.3.2_M Multiply any number by a 2-digit number, with and without regrouping, and divide any number by a 1-digit number, with and without a remainder (e.g., 3427×68 ; $1380 \div 6 = \underline{\quad}$).
Simple fractions: Recognition of the magnitude of fractions	Which is greater: $4/5$ or $3/15$	G5-6	G5: N2.1.3_M Compare and order fractions with different but related denominators up to 12. G6: N2.1.3_M Compare and order proper and improper fractions with different, unrelated denominators.
Complex fractions: Addition of a fraction and a mixed number	$1 \frac{1}{6} + \frac{1}{3} = \underline{\quad}$	G6	G6: N2.2.1_M Add and subtract improper fractions or mixed numbers with different but related denominators.
Simple algebraic equations: Solving for a variable requiring one step	$17x = 68$ $x = \underline{\quad}$	G6	G6: A3.2.1_M Find a missing value in a number sentence using any one of the four operations.
Complex algebraic equations: Solving for a variable requiring two steps	$-5y - 3 = 12$ $y = \underline{\quad}$	G7	G7: A3.3.1_M Represent and solve problems, including real-world problems, using a two-step equation with any of the four operations.
Subtraction word problem	There were 43 children in the park. Out of these, 25 of them have gone home. How many children are in the park now?	G4	G4: N1.4.1_M Solve simple real-world problems involving addition and subtraction of whole numbers within 100 (i.e., where the sum or minuend does not surpass 100) with and without regrouping, including problems involving measurement and currency units.
Division word problem	A shopkeeper has 48 apples. He keeps 3 apples in each box. How many such boxes will he need to keep all the apples?	G5	G5: N1.4.2_M Solve simple real-world problems involving the multiplication of two whole numbers to 10, and associated division facts.
Fractions word problem	There were 108 goats in the pen. $\frac{1}{6}$ of them were black. How many goats were NOT black?	G5	G5: N2.3.2_M Solve real-world problems involving the multiplication and division of a proper fraction and a whole number.
Algebraic equations word problem	A number plus 8 equals $\sqrt{144}$. What is the number?	G7	G7: A2.1.1_M Use linear expressions to represent problem situations with a single variable (e.g., The cost of buying cinema tickets online is £12 per ticket plus a £2 booking fee. Write this as an expression where x is the number of tickets purchased). G7: A3.3.1_M Represent and solve problems, including word problems, using a two-step equation with any of the four operations (e.g., solve $3x + 4 = 22$; Some people got on a bus, doubling the number of passengers. At the next stop, 8 people got off, leaving 16 people on the bus. Represent the situation as an equation, and solve to find the number of people on the bus originally).

Appendix E: The Learning Crisis: Causes, Contributors, and Consequences



Enrolment and literacy rates around the world have increased at record speed in recent decades

Growing global focus on broadening access to schools has led to significantly improved enrolment rates

Over the last 75 years, there has been a significant global shift towards expanding schooling infrastructure and enrolment outreach in an effort to achieve universal education. As a result, more children are in school today than at any other time in history – both in absolute and relative numbers (World Bank, 2018). Of the nearly 2 billion children under 14 years of age worldwide, 80% are now enrolled in school, with the majority living in low- or middle-income countries (LMIC). In LMIC in particular, nominal enrolment rates have increased at unprecedented speeds, now reaching near-universal levels (Pritchett, 2013).

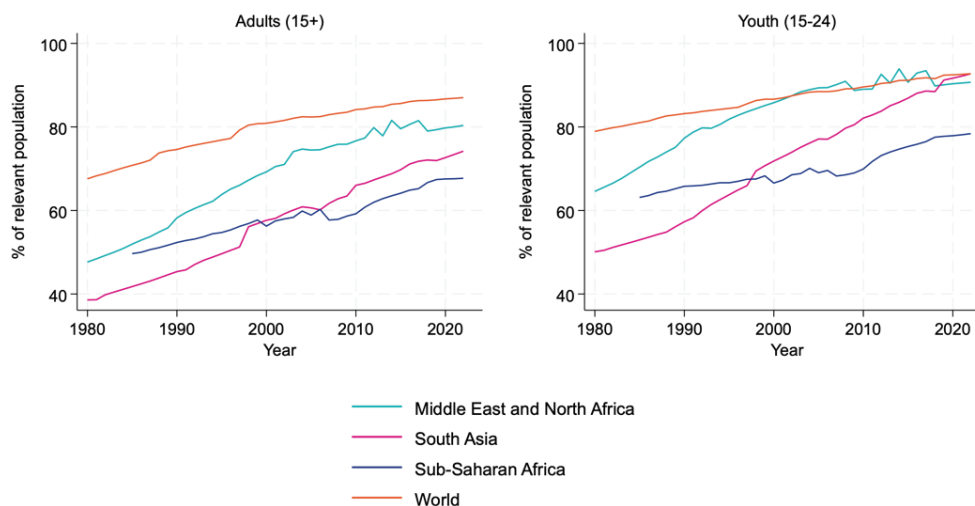
For example, it took Bangladesh only 20 years to achieve nearly universal gross enrolment, growing by 33 percentage points between 1987 and 2007, starting from 65%. Similarly, Pakistan reduced the proportion of out-of-school children from 1 in 3 to 1 in 6 over the 2001-2021 period (World Bank, 2024). Morocco saw an impressive 54% increase in girls' enrolment over 11 years – a feat that took the United States 40 years to accomplish. More broadly, between 1970 and 2010, the gross Primary enrolment rate in sub-Saharan Africa and South Asia surged from 68% and 47%, respectively, to over 100% in both regions (World Bank, 2018). These remarkable gains illustrate the successful efforts of countries worldwide to match enrolment rates in high-income nations, reflecting a global commitment to the importance of education.

Increased enrolment has been accompanied by growth in literacy rates

With ever-larger shares of the population being exposed to formal schooling, officially reported literacy rates have increased dramatically. Globally, literacy rates more than doubled, from 42% in 1960 to 86% in 2015 (Rosier & Ortiz-Ospina, 2013). Along with expanded access, this represents a remarkable achievement in expanding educational access.

Literacy Rates Over Time in Selected Regions

Source: World Bank



Despite successes in expanding enrolment and raising literacy rates, more progress is needed

Barriers to enrolment still persist

Access to schooling is a crucial prerequisite to learning, and the rapid, worldwide increases in enrolment in recent history are cause for hope. However, enrolment is still not universal; in 2018, 1 in every 6 Primary and Secondary school-aged children still remained out of school, which accounts for a total of 258 million children worldwide (UNESCO, 2023b). The COVID-19 pandemic further exacerbated this situation, with school closures keeping out almost 1.6 billion children (Azevedo, 2020), and even after schools reopened, many students never returned (UNICEF, 2023; Mighati, 2022).

Several barriers to enrolment persist. In some contexts, particularly in rural areas, there are 'education deserts', where large shares of the population do not live within a reasonable distance from the closest school, or are barred by impassable terrain or issues of travel safety. In other contexts, even government-led schooling is not free and/or compulsory, or comes with associated fees for school uniforms, meals, or textbooks - the cost of which can be prohibitive for many prospective students and their families (Abdul Latif Jameel Poverty Action Lab, 2019; Oyekan et al., 2023).

Beyond physical, financial, and infrastructural barriers, the quality of education offered by school systems is a crucial factor for ensuring that children not only enter school, but also remain in and advance to the next levels of school. There is a significantly stronger likelihood that students will drop out of school or will not transition to higher grades or levels of education if they are not academically thriving (Pritchett, 2013), and the responsibility of ensuring the scholastic achievement of all students falls on the education system, to a far greater degree than it is dependent on students' backgrounds or characteristics (OECD, 2012; Eble & Escueta, 2022). Ultimately, failure to ensure adequate student retention and attainment has negative implications for both the education system and for students. It is more costly for education systems to devote educational resources to students who must repeat grades or who ultimately withdraw from formal education, and high rates of dropout are equated with lower levels of productivity in the labour force, which is detrimental for individuals and whole societies alike (OECD, 2012; Patrinos & Psacharopoulos, 2018).

Access to education must start with early childhood

While great progress has been made in recent decades towards enrolling larger numbers of school-aged children, children in many contexts enter school later than the intended age, which can profoundly impact the rate at which they master skills during their academic careers and how well they develop into adulthood. For example, in Guinea-Bissau, more than three quarters of children in Primary school are over-age (UNESCO, 2023a), and this is largely due to late enrolment, with only 30% of children beginning school at the specified age of six (Borgen Project, 2021). In Nigeria, 1.8 million children were attending Primary school after the age of 11 during the 2018-2019 school year (Sasu, 2022). A 2017 study conducted in Uganda found that student ages in the final year of Primary school ranged from 12 to 22 years, with most students being 16 years old (Nath et al., 2017). In some contexts, late entry is a result of positive systemic changes that have broadened access to education (World Bank, 2020b) by making schooling available to children who were previously barred from it. However, in the long term, it is more advantageous for students to be equipped with school readiness by entering a learner-centred environment as early as possible – ideally through early childhood development education (Sosu & Pimenta, 2023). This plays a critical role in ensuring that students keep pace with curricular expectations, thereby maximising their potential throughout their academic careers and beyond.

Despite the value of investing early in children's lives, 250 million children in low- and middle-income countries (LMIC) were found to be developmentally at risk in 2016, partly due to a lack of early learning programmes – a figure alarmingly similar to that of children out of school entirely in 2019 (Black et al., 2017; UNESCO, 2019). Similarly, UNICEF (n.d.) reports that developmental delay affects 43% of the population under the age of 5. This highlights a pervasive, systemic issue that has seen little improvement over the last decade – an issue that begins with pre-Primary programmes and continues to hinder retention in later years of schooling across education systems. Low enrolment in early childhood education remains widespread: Over 4 in 10 age-appropriate children worldwide were not enrolled in pre-Primary school in 2020, and the vast majority of countries do not include it in free and compulsory education (UNESCO, 2022a). For children to succeed academically, it is imperative that they start with a strong foundation. At this formative stage of cognitive development, children benefit greatly from a learning environment that places them on the appropriate path towards essential skill-building (Sosu & Pimenta, 2023; UNESCO, 2022b). Education systems are further incentivised to make pre-Primary school access more equitable as it yields the highest return on investment compared to all other stages of schooling and contributes to a smoother-running Primary education system by preparing students to participate meaningfully (UNICEF, 2019).

Students should have the opportunity to enter school at the earliest possible stage to begin their path to becoming lifelong learners, and education systems must be ready to provide them with high-quality education through strong teacher professionalism and accountability – starting with early childhood programmes, appropriately levelled curricula, and environments dedicated to learning. While evidence suggests that most LMIC are nearing their goals of universal access to Primary schooling, this is not the case for early childhood programmes. Ensuring a strong foundation from before Primary school, at the developmentally appropriate age, is a crucial next step for education systems to maintain their current progress and transition from merely increasing schooling to enhancing learning.

Enrolment is necessary but not sufficient

Focusing solely on enrolment is not sufficient to ensure that children are actually learning. The goal of universal education is not merely about superficially exposing children to educational institutions; it also requires that these institutions effectively equip students with the foundational skills necessary to function as members of a knowledge-based economy and to lead fulfilling lives (Pritchett, 2013). The alarming reality is that, despite the unprecedented number of children attending school for longer periods, many are still not mastering the skills they need to excel. This lack of learning, despite many children being enrolled in school, is the defining characteristic of the current learning crisis - and affects most countries around the world.

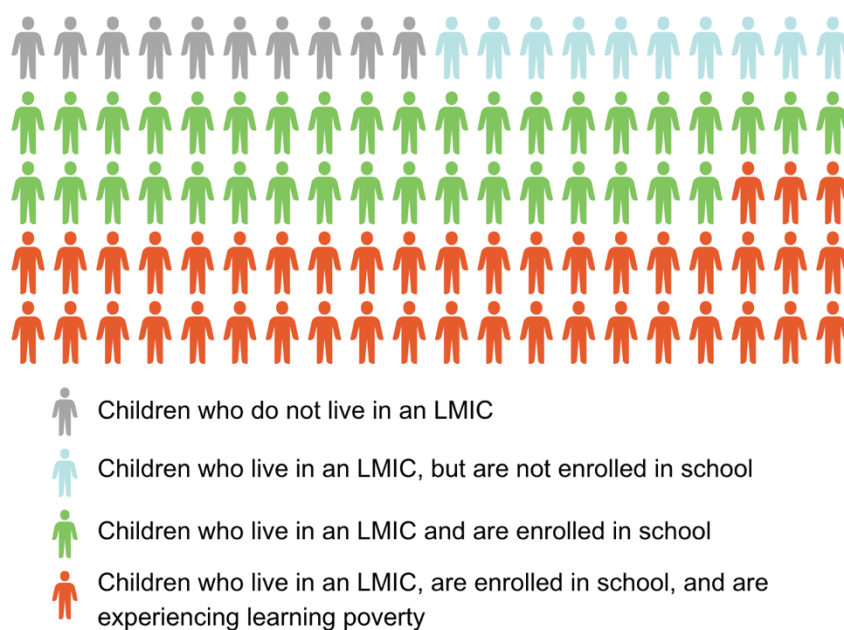
“This lack of learning, despite many children being enrolled in school, is the defining characteristic of the current learning crisis - and affects most countries around the world.”

The rapid increase in enrolment in recent years, coupled with the learning crisis, presents both a policy opportunity and a serious risk. On the one hand, inaction means that more resources will need to be spent on maintaining underperforming education systems that do not yield the returns in human capital that will fuel economic growth and innovation. On the other hand, the greatly expanded access to schooling also provides an opportunity for positive impact on an unprecedented scale. Capitalising on the progress made in bringing children into schools as a crucial first step, policymakers can now implement interventions aimed at improving education quality, so that children in schools actually learn.

Progress is needed on true measures of literacy

As mentioned before, a notable success in recent decades is the doubling of global literacy rates between 1960 and 2015 (Roser & Ortiz-Ospina, 2013). That said, while literacy rates are often used as a measure of education quality, they provide an incomplete – and often overly optimistic – picture of learning outcomes globally. In particular, official literacy rates in LMIC can be misleading due to variations in measurement methods – including self-reporting of literacy levels, which often inflate actual proficiency levels and reflect a level of optimism that does not match the levels of actual reading proficiency. For instance, in sub-Saharan Africa, the illiteracy rate is said to be 24%, but 87% of children are in learning poverty (World Bank, 2018). In Pakistan, the youth illiteracy rate for people aged 15-24 was 73% in 2019, while only 23% of children could read with comprehension (World Bank, 2023).

Distribution of Children Age 0-14 by Region, Enrollment, and Learning Status



In this context, it is crucial to examine what exactly defines “literacy.” Some definitions – including, implicitly, most official ones – describe it simply as a single, often low, threshold to cross, rather than as a framework within which students should develop the skills to navigate and grow. From an academic perspective, this type of benchmark for achievement may be set too low to ensure substantial returns on subsequent investments on education. Therefore, even if official literacy statistics suggest that a significant portion of a population is nominally literate, it is important to recognise that, in most cases, the majority of youth worldwide remains far from achieving the ultimate goal of literacy: reading comprehension. This skill, which involves extracting meaning from and applying the purpose of a text, is what enables students to progress *from learning to read to reading to learn*.

In the global effort to address the learning crisis, progress is needed on true measures of literacy. Students must be able to understand written class materials in school if they are to gain subject-specific content knowledge and develop more advanced skills. Citizens must be able to comprehend what they read if they are to be civically and economically engaged. Thus, education systems - particularly those that are faced with the opportunity to impact large numbers of new students - must go beyond merely raising literacy rates by superficial measures, and teach students how to *read to learn*.





Learning outcomes are weak and urgently require transformative interventions

Foundational literacy and numeracy skills are severely lacking among students in all levels of schooling, but especially in Primary grades

Ensuring that children have access to school, start school at a developmentally appropriate age, and remain in school for the expected duration is a substantial undertaking. However, success in these areas alone does not guarantee that students are receiving an education that will adequately equip them for their future careers and daily lives. Learning, especially when it is not measured for efficacy, is not the natural by-product of school attendance (World Bank, 2018; Pritchett, 2013). In fact, persistently low learning levels are prevalent in all low- and middle-income countries (LMIC), where over half of all children experience “learning poverty” according to the World Bank, despite the fact that most of them are attending school. Moreover, this regional average conceals the severity of the problem in specific areas, such as sub-Saharan Africa, where learning poverty is estimated at approximately 90%, and in the Middle East, North Africa, and South Asia, where more than 6 in 10 children do not meet the minimum expected proficiency levels. These shortfalls in learning outcomes among enrolled students indicate insufficient education quality, which prevents them from mastering increasingly complex curricular expectations and may lead to their eventual withdrawal from school.

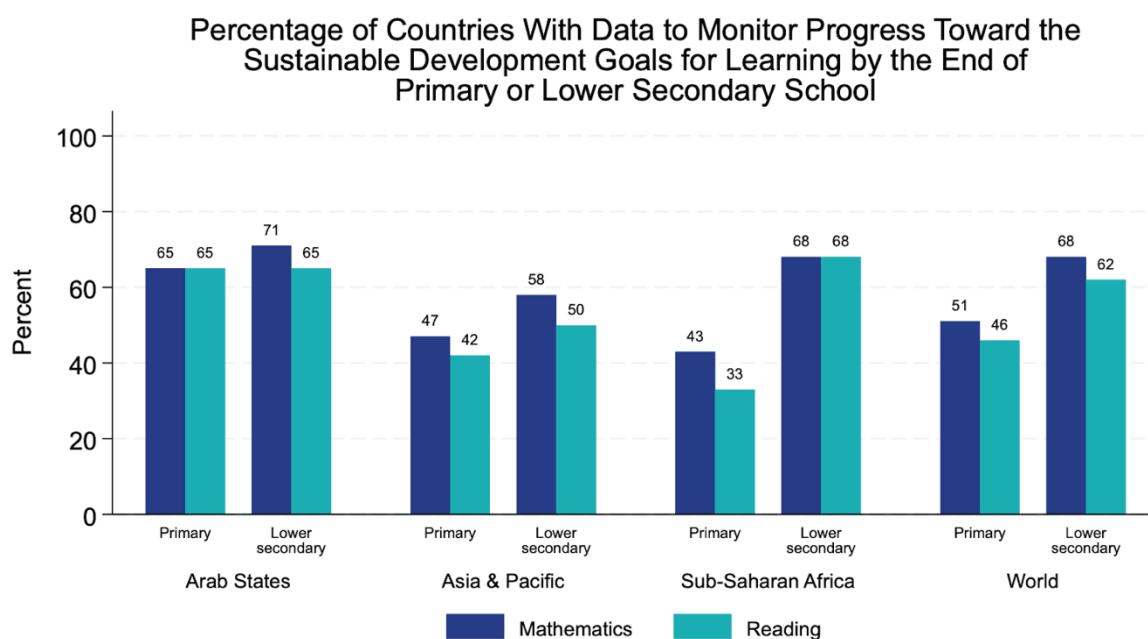
Literacy, the most extensively studied foundational skill, can also be examined among students in LMIC. Competency in this domain is essential for students to follow written instructions, engage with learning materials, participate in assessments, and gain knowledge in every core subject. However, evidence indicates a widespread lack of proficiency in many early-grade subskills that are fundamental to literacy. For example, in Pakistan in 2023, half of Grade 5 students were unable to read a story in Urdu considered appropriate for a Grade 2 curriculum (ASER Pakistan, 2024). Similarly, 80% of Grade 2 students in Ghana and Malawi were unable to read a single familiar word, such as “the” or “cat,” during assessments conducted at the end of the school year. When assessing literacy using a three-sentence passage and lowering the threshold, 75% of students in Nigeria, Uganda, and Bangladesh did not qualify as literate by the end of Primary school (World Bank, 2018). Despite widespread recognition of the benefits of literacy and the negative consequences of illiteracy, there remains a pervasive lack of proficiency in this essential skill among students within and across education systems.

Problematic literacy rates are mirrored by numeracy rates, which could also significantly hinder students' ability to function in their daily lives. For instance, 50% of all third graders in Uganda cannot solve simple subtraction problems. In rural India, 54% of third graders cannot complete double-digit subtraction, and by Grade 5, half of these students still cannot solve the same operations (World Bank, 2018). Similarly, only 60% of students in urban Pakistan could correctly perform double-digit subtraction by Grade 3, a figure that drops to 40% for the same grade level in rural areas. The lack of numeracy proficiency seen in these contexts extends to broader regions as well. For example, across sub-Saharan Africa, the Middle East, and North Africa, the average percentage of students who score above the minimum proficiency level on a mathematics assessment is between 18% and 42% (World Bank, 2018). While the specific interventions needed to elevate foundational numeracy learning will vary based on the context of each education system, the urgent need to address low learning levels is clear.

Moreover, without the implementation of effective policy solutions to improve learning outcomes, vast amounts of educational resources will continue to be expended without a meaningful return on investment. Globally, for instance, 125 million students who have completed four years of schooling still lack functional literacy or numeracy skills, demonstrating a widespread failure to achieve desired educational outcomes – through no fault of their own – despite the investment in them. This calls for targeted, transformative approaches to address the ongoing learning crisis and to ensure that education funding yields its expected benefits – especially crucial in the aftermath of the economic downturn triggered by COVID-19 (United Nations, 2020).

“Without the implementation of effective policy solutions to improve learning outcomes, vast amounts of educational resources will continue to be expended without a meaningful return on investment.”

Finally, to complicate the matter further, one-third of 121 countries have also been found to lack the data assessing reading and mathematics proficiency levels among children (World Bank, 2018). Therefore, it is pivotal that educational interventions operate with a data-driven core, not only to certify and track their efficacy within education systems, but also to benchmark student progress against international standards, thereby ensuring that students are prepared to become globally competitive adults.



Year-on-year improvement is too slow for students to keep pace with their high-performing peers

Compounding the problem of non-universal enrolment, late enrolment, and low levels of foundational literacy and numeracy, students in LMIC are not making yearly progress at a pace that puts them on track to meet curricular expectations in their own countries, or to catch up with their peers in HIC. Currently, high-performing students in middle-income countries would be ranked in the bottom quarter in wealthier countries, while for many education systems in LMIC, the current rate of student learning would not result in globally comparable content mastery in a reasonable number of decades (World Bank, 2018; Pritchett, 2013). According to a simulation by the World Bank, it would take an estimated 50 years just for LMIC to halve current levels of learning poverty (Azevedo, 2020).

The evidence clearly indicates that generations of students are at risk of continuing to lag behind expected learning levels. However, rapid improvement on a large scale is attainable. If every LMIC in the world were to produce learning gains at a rate that doubles or triples their historical progress, learning poverty would be reduced by almost half by 2030 (Azevedo et al., 2021), which would be an 82% reduction in the counterfactual projection of time needed to meet this goal. Given this, the critical dual objective of education systems in LMIC is to not only achieve large learning gains, but also augment the pace at which they are achieved.

The COVID-19 pandemic led to significant setbacks in learning progress

The onset of COVID-19 has drastically increased the prevalence of weak learning outcomes across the globe. Not only did existing deficits in learning worsen in the years during and following the pandemic, but the resultant need for specialised systems that will reverse learning losses from this global event also presents another obstacle to advancement for education systems that are susceptible to low performance. According to the most recent reports provided by UNICEF and the World Bank, the average student in a low-to-middle-income country spent close to two school years (236 days) out of school (World Bank, 2023), and learning poverty in LMIC was estimated to have increased beyond original estimates of 53% to as much as 70% – an increase that would signify three years of pandemic-related learning loss (Azevedo et al., 2022).

While longer school closures are correlated with a more pronounced decline in learning, the availability of distance learning technologies also played a significant role in students' ability to keep pace with academic expectations. However, in nearly all low-income countries, more than half of the population does not have access to the internet at home (World Bank, 2023). While other at-home learning models were employed by most LMIC that did not require internet connectivity – such as radio lessons, televised lessons, or take-home packages – these did not allow teachers to verify student engagement with lessons via observation, nor did they enable teachers to track student understanding of the subject matter while instructing (World Bank, 2023). In this sense, the tradeoff education systems faced when innovating distance-learning approaches to reach a greater number of students was the inability to manage these students' mastery of lesson content in real-time.

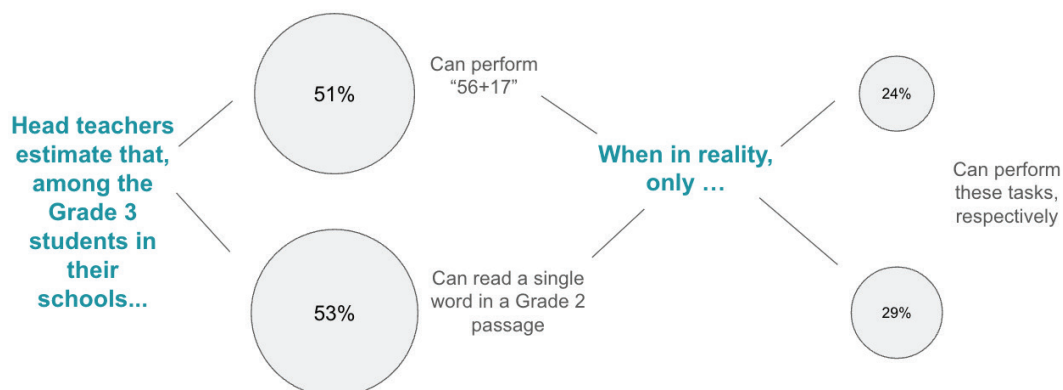
As a result, many students across LMIC learned much less than they would have if participating in conventional, in-person instruction, and therefore, more students demonstrated lower learning levels from 2020 onward. In Brazil, for example, some students participating in at-home learning absorbed only 28% of the content they would typically learn in school (World Bank, 2023), and thus scored over 50 percentage points lower than projected in maths and nearly 40 percentage points lower in language on state exams administered in Sao Paolo in 2021. A similar scenario is observable in South Africa, where second- and fourth-grade students learned only an average of 25-41% of a year's worth of instruction during the pandemic. In India, more than half of second-grade students were already reading fewer than 10 correct words per minute (cwpm) prior to the onset of COVID-19, and this share increased by 42% in 2020 (UNESCO et al., 2021). This disruption to education interrupted the academic trajectory of students on a worldwide scale (United Nations, 2020), with the most significant consequences for students in early grades needing to master foundational skills and for those who were already struggling in their learning. In response, researchers and policymakers have offered and tested a number of solutions involving structured pedagogy, edtech-based solutions, targeted instruction, among others, that aspire to reclaim a positive learning trajectory on an accelerated timeline (UNESCO et al., 2021).

In this sense, teachers need the support of impactful tools and resources, and the motivation of effective leadership, in order to implement systemic changes to education systems in their classrooms, which students will require to overturn the severe learning losses incurred in recent years. Education systems in LMIC, which already faced a learning crisis prior to the advent of COVID-19, are now further incentivised to unite key stakeholders in introducing transformative interventions that will standardise high-quality learning opportunities for all students.

Policymakers often underestimate the extent of the learning crisis

Given the limitations of officially reported literacy rates as metrics for education quality, the lack of reliable learning data at both macro and micro levels in many education systems, and the prevalence of large class sizes, it is not surprising that many policymakers and school officials around the world significantly underestimate the scale of learning gaps in their own contexts. For example, a study involving 931 interviews with officials in sub-Saharan Africa and the Asia-Pacific regions revealed a widespread overestimation of student proficiency in foundational skills by policymakers. This study found that, on average, policymakers believed that twice the actual proportion of students had attained foundational literacy compared to the figures determined using the World Bank's Learning Poverty indicator (Crawford et al., 2021). Similarly, several large-scale studies led by NewGlobe across four Nigerian states (Anambra, Enugu, Jigawa, and Oyo) confirmed the gross overestimation of learning levels even by head teachers regarding their own students. For example, while head teachers estimated that 51% of their Grade 3 students could solve "56 + 17", a Grade 2 skill in the Nigerian curriculum, only 24% could actually do so. Moreover, consistently across the four states, the gaps between head teachers' estimates and actual student performance were significantly larger among the lowest-performing schools.

According to NewGlobe studies across four Nigerian states,



The mismatch between the beliefs of different stakeholders within education systems worldwide and the actual performance of the students they serve is concerning for at least two reasons. First, it highlights the systematic lack of reliable large-scale assessment data on learning outcomes, as well as the absence of best practices in formative assessments to diagnose critical areas of improvement at both macro and micro levels within systems. Secondly, the overestimation of students' actual skills by policymakers, head teachers, and teachers likely contributes to the slow progress towards implementing concrete programmes aimed at improving learning outcomes. For example, Crawford et al. (2021) found that while four in five interviewed officials (79%) acknowledged that the learning crisis affected both their own country and the globe, only 2% considered foundational reading or literacy programmes as the most significant recent educational reform in their context. Moreover, overly positive perceptions of students' skills in foundational literacy and numeracy were strongly correlated with a reduced motivation to focus on reform in these areas. Consequently, the relative lack of policy focus aimed at strengthening core student competencies may stem from an overly optimistic view of the state of learning, driven by inadequate visibility into accurate measurements of educational outcomes.

“The overestimation of students' actual skills by policymakers, head teachers and teachers likely contributes to the slow progress towards implementing concrete programmes aimed at improving learning outcomes.”

Increased heterogeneity in learning levels poses a new challenge

Recent successes in raising enrolment rates have brought many children into classrooms who would otherwise not have enrolled in school. This has created a new challenge for education systems: how to educate larger and more heterogeneous groups of students. Multiple levels of heterogeneity exist, and have distinct implications. Heterogeneity *within classrooms* requires teachers to tailor their instruction to a wider range of proficiency levels within their classrooms (Ganimian & Djaker, 2023). Additionally, heterogeneity *between classrooms or between schools* - where learning levels vary widely across classrooms or schools within an education system (Rodriguez-Segura & Tierney, 2024) - poses challenges for central planners who must set appropriate curricular levels system-wide, and/or establish guidelines for schools to diverge from the central policy prescription.

Heterogeneity in students' preparation *within* a classroom makes teaching more challenging, especially in contexts of low teacher capacity, where teachers may already be taking on larger class sizes or have less systemic support. Education systems have adopted a variety of strategies that can reduce heterogeneity, and some have been more effective than others (Ganimian & Djaker, 2023). Expanding access to high-quality early childhood education - with the idea that it can foster a stronger foundation for Primary school - has been successful in improving learning outcomes in upper-middle-income countries (Berlinski et al., 2009), though less so in lower-middle- and low-income countries (Bouguen et al., 2018; Blimpo et al., 2019). Similarly, providing reports for principals and school leaders on their students' performance in maths and language - either as standalone information or in combination with other interventions such as training to design improvement plans based on the data - have proven effective in UMIC and less so in LMIC (Muralidharan & Singh, 2022; de Hoyos et al., 2022).

Providing the lowest-performing students with opportunities to catch up with their higher-performing peers can reduce the need for teachers to cater to a wide range of preparation levels within a classroom (Banerjee et al., 2007; Álvarez Marinelli et al., 2019), as has remediation before or after school (Saavedra et al., 2017). Using technology to differentiate instruction - by presenting different material to students at different preparation levels - has had limited success; providing students with hardware, either by itself or pre-loaded with educational software intended for use in independent self-paced learning, has typically failed to improve learning outcomes (Cristia et al., 2017). What has been effective, however, is combining technology-based solutions with pedagogy that is responsive to students' current levels. Software that dynamically adjusts the content and difficulty of the material based on students' performance - as contrasted with pre-loaded, static content - had moderate to large impacts on achievement (Muralidharan et al., 2019).

Just as within-class heterogeneity can create challenges for teachers in delivering effective instruction to every student, heterogeneity across schools can pose similar challenges for central planners in setting curricular levels for entire education systems. On the one hand, a one-size-fits-all approach to curriculum setting, even if moderately well-calibrated to learning levels within an education system, risks leaving behind many children on both ends of the distribution. One recent study examines the extent of between-school heterogeneity in six education systems (Rodriguez-Segura & Tierney, 2024) - and finds that learning levels, though low overall, can show considerable variation by school. It also finds that the degree of heterogeneity increases with grade, and varies by subject. In systems with a high degree of between-school heterogeneity, customising the instructional level of the curriculum for the needs of different schools given their baseline levels of performance could enable the education system to reach a significantly higher share of children through appropriate instruction. Yet, such an intervention would require an agile system of assessment and material distribution that does not exist in many countries, and that current governance systems may not be equipped to deliver.



The causes of weak learning outcomes are many

Visible, input-based policies are heavily relied on, but their effectiveness is dubious

The most visible manifestations of government efforts to enhance educational opportunities for the growing number of students in their systems have often focused on input-based solutions, particularly as a perceived alternative to improving quality when education systems fail to meet established standards. A lack of tangible resources - such as paper, textbooks, or technological hardware - in some schools has been regarded as a significant barrier to improving learning. In some cases, this concern is valid; for instance, one study found that less than half of all students in Niger and Nigeria had paper to write on, while there was only one maths textbook for every 66 students in Togo (World Bank, 2010-2014). Such deficiencies can hinder the learning process, especially when instructional efficiency is limited. In this sense, inputs are necessary to a degree, but they are not sufficient as a standalone improvement effort.

Despite the shortage of certain materials that may act as prerequisites for strong learning outcomes in many education systems worldwide, the mere injection of resources into classrooms and schools has not been shown to result in higher levels of academic achievement and may even act as a detractor. In other words, if the specific factors inhibiting learning gains in a school have not been identified, indiscriminate expenditures may have little effect, while existing problems persist. For example, in 2008, textbooks distributed to schools in Sierra Leone were discovered unused in a cupboard during a follow-up inspection. Speculation suggests that teachers were hesitant to risk damaging these rare resources (World Bank, 2018), but their lack of use represents a missed opportunity for student learning and signifies non-cost-effective spending on education improvement. Another, more far-reaching example is the One Laptop per Child (OLPC) initiative, which was an ambitious effort to enhance learning via technology access in over 42 countries (Yanguas, 2020). However, one year after successful distribution, nearly half of the teachers reported rarely or never using the laptops in the classroom (World Bank, 2018). Various studies across parts of the developing world have shown neutral or negative effects on academic outcomes stemming from OLPC. In some cases, students spent more time on their computers but less time on independent study or other learning-based activities (Meza-Cordero, 2017). Further evidence aligns with these findings, indicating that the introduction of educational technology hardware only has a 6% positive effect on student learning, while the remaining 94% of the effect is either neutral or negative.

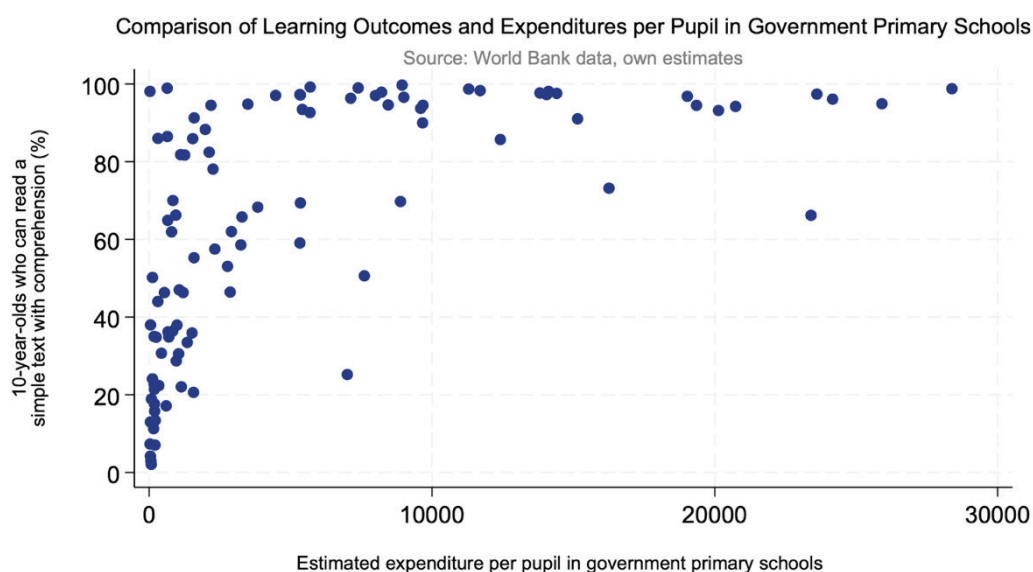
In response, it is imperative for education systems in LMIC to maintain momentum with holistic and proven-effective approaches, so that gaps in educational achievement do not widen during misdirected pursuits. Furthermore, curricular design should justify how and why material or technological inputs are used. These resources must fortify pre-existing teacher-learner relationships as complementary tools, not substitutes (World Bank, 2018). In this sense, while targeted, scaled investments in education are needed to improve learning outcomes, misguided efforts to enhance schooling through simple increases in inputs like books or computers will at best lead to wasted resources, and at worst, exacerbate already-problematic learning levels.

In countries where overall educational spending is relatively low by global standards, *how* resources are used is more important than *how much* is spent.

Governments worldwide have dedicated significant resources to their education systems, especially in response to the rapid increases in enrolment over recent decades. For instance, while the number of Primary school children globally rose from 502 million in 1978 to 732 million in 2018, the student-teacher ratio decreased from 29 to 23 over the same 50-year period, demonstrating countries' commitment to matching "inputs", in this case teachers, with enrolment growth. Given the considerable investment and the potentially high opportunity cost for other development initiatives, it is crucial that these resources be used effectively to ensure that any level of government spending translates into improved learning outcomes.

In general, there is a positive correlation between higher investment in education and improved educational outcomes. For example, a 1% increase in the share of GDP spent on education correlates with a 5.6 percentage point reduction in learning poverty. More tangibly, each additional USD 100 spent on Primary students in government schools reduces nationwide learning poverty by approximately 0.3 percentage points.

However, this relationship between educational investment and learning outcomes is not linear. For instance, among countries spending less than USD 5,000 per student annually in public Primary schools, there is considerable variation in learning outcomes, even with similar spending levels. For instance, Tunisia and Georgia both spend between USD 600 and 700 per student, yet their learning poverty rates differ greatly: while the learning poverty rate in Georgia is only 14%, the learning poverty rate in Tunisia is nearly 5 times that at 66%. This variation among lower-spending countries underscores the importance of prudent financial allocations towards initiatives that can genuinely enhance education quality without incurring excessive costs.



Note: estimates derived using the latest value available on the World Development Indicators for each of the following metrics — GDP (current US\$), Government expenditure on education, total (% of GDP); Expenditure on primary education (% of government expenditure on education), Primary education, pupils, School enrollment, primary, private (% of total primary), Learning poverty: Share of Children at the End-of-Primary age below minimum reading proficiency adjusted by Out-of-School Children (%)

Achieving efficient use of educational investments requires ensuring that resources in LMIC are directed towards evidence-based interventions that have demonstrated impact on learning gains, making the investments, in turn, cost-effective. In other words, *how* allocated resources are used is more critical than *how much* is allocated, up to a certain threshold. For effective decision-making that maximises cost-effectiveness, educational resource allocation should prioritise strategies that yield measurable results rather than those with high visibility. Approaches that build a solid foundation in literacy and numeracy before focusing on other more visible academic inputs have produced positive results in many contexts, and hold the potential for large returns on investments in LMIC. By focusing on effective, proven interventions, increased investments in education by currently low-spending countries can lead to improved learning outcomes for future generations who will fuel their countries' economic growth.

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Importantly, policymakers and education personnel alike should be prepared to recognise that reforms targeting pedagogical improvement and increased accountability are not always as visible as input-based policy changes such as the building of new schools or efforts to increase enrolment and attendance. Nonetheless, the appropriate interventions have the potential to drive unprecedented gains in learning, which is the strongest indicator of a policy's effectiveness. As Rukmini Banerji succinctly summarises it, “Discussions focused on learning are neither easy nor automatic” (Mbiti, 2016). Furthermore, while policies may be adapted for a given education system based on their replicated success in other contexts, it is imperative that education leaders investigate the nuances of the selected education system, in order to ensure that policy implementation is scalable, cost-effective, and aligned with the most urgent learning needs.

Low teacher content knowledge can translate into poorly executed pedagogy

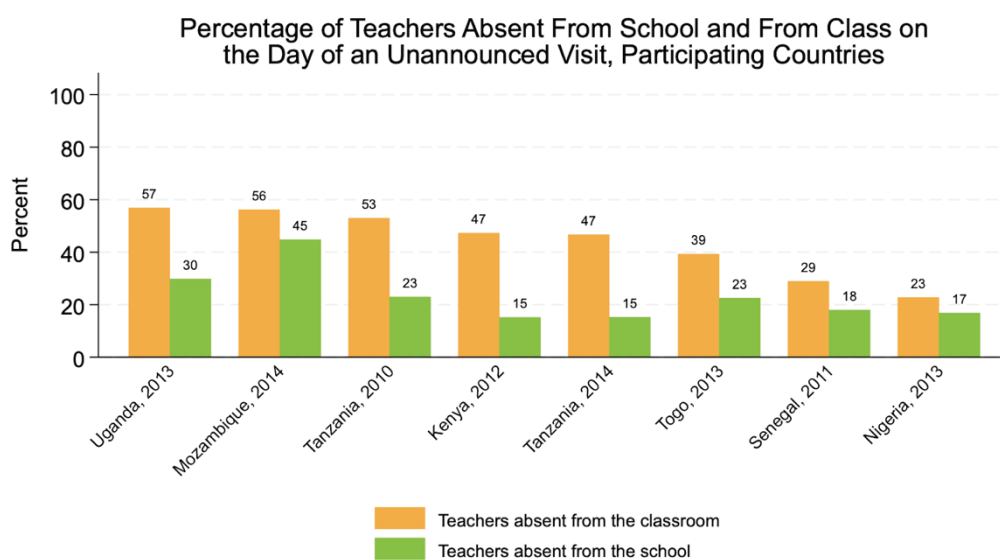
Teachers are central to what can be achieved in any classroom and are the most influential factor across all education systems (Vegas, 2020). Their professional competence and the rapport they build with students enables them to assess learning levels and help students reach their academic potential. However, in some LMIC, teachers may lack the content knowledge needed to effectively support struggling students. For instance, in 14 sub-Saharan African countries, teachers performed at the same level on reading tests as their highest-performing Grade 6 students (World Bank, 2018). Similarly, in India, two-thirds of teachers (66%) could not correctly solve a Grade 5 maths problem. Studies suggest that these deficiencies in teachers' subject knowledge can negatively impact student achievement. In some cases, as much as 30% of students' failure to meet curricular expectations was attributed to a lack of teacher content knowledge. Supporting this, evidence shows that large proportions of teachers in Kenya and Togo could not accurately correct at least 80% of student answers on a fourth-grade mathematics test, revealing an inability to evaluate student learning or guide them towards improvement (Brunetti et al., 2021).

Even when teachers have mastered the content, central instructional design decisions or differing teacher incentives may lead them to focus on higher-performing students. For example, teachers may prioritise maintaining instructional flow over supporting struggling students, or they may push through the curriculum without addressing areas where students need more help. Such approaches are often at odds with the strategies students need for success, and can contribute to student dropout (World Bank, 2018). To explore this issue further, various studies have assessed teachers' pedagogical skills. The World Bank's Service Delivery Indicators report found that the average teacher in Indonesia scored only 25% on a pedagogy assessment in 2019 (World Bank, 2020a), while in Madagascar in 2014, the average teacher scored just 23% (Wane & Rakotoarivony, 2017). In Pakistan, Primary school teachers assessed on several pedagogical skills, including lesson facilitation, checks for understanding, and fostering critical thinking using the TEACH tool, saw nearly two-thirds (63%) of teachers score between two and three out of five. The lowest scores were in the areas of fostering critical thinking, providing feedback, and promoting social and collaborative skills (Molina et al., 2020).

The consequential link between poor content knowledge and unsatisfactory pedagogical performance provides policymakers with the opportunity to address both shortfalls simultaneously. Solutions like structured pedagogy can provide teachers with expertly researched lesson content that will not suffer from low levels of teacher expertise in subject matter, and include essential techniques, like scaffolding, that ensure the teacher properly paces delivery of the lesson with students' ability to achieve mastery of foundational concepts.

Strong governance is essential for encouraging teacher professionalism and accountability

Regardless of whether teachers possess ideal levels of content knowledge and pedagogical skills, it is essential that they uphold professionalism and accountability if they are to be effective. For this to occur, they must be supported by effective governance administered by informed policymakers. However, evaluative reports suggest that these vital elements are not always in place. Across eight African nations studied between 2010 and 2014, for instance, teachers were frequently absent from their classrooms or the school itself. In Mozambique, Uganda, and Tanzania, teacher absenteeism rates were close to or exceeded 50% (World Bank, 2018). Absenteeism on this scale reduces actual instructional time from that of a typical school day to approximately two to three hours per day, on average. Instructional time is further compromised when present teachers interrupt their classes to check on other classrooms left unsupervised due to absenteeism and a lack of substitute coverage (Bashir et al., 2018; World Bank, 2018). Teachers who are required to integrate these unattended students into their own class are forced to dilute the benefits of ability-grouping and disrupt the appropriate scope and sequence of academic content by delivering it to students for whom it was not intended.



Source: World Development Report 2018 Data

Effective school-monitoring practices are essential to address high rates of absenteeism across LMIC, but they are not always utilised to ensure consistent teacher attendance. In Tanzania, for instance, only 30% of schools reported that recent visits from Ministry of Education officials were related to teaching and learning. In a sample of public schools in India, no teachers with high absenteeism rates were dismissed by principals during their tenure (Mbiti, 2016). Additionally, UNICEF's Time to Teach study found that in several West and Central African countries, school leaders refrained from sanctioning frequent absenteeism due to uncertainty about the education system's hierarchy or doubts that corrective action would follow (Karamperidou et al., 2020).

Regular observation by school leaders and the introduction of programmes that tie professional benefits for teachers directly to academically constructive behaviours can lead to reduced absenteeism and improved classroom engagement, which naturally benefits students. For instance, a study of public schools in India showed a 25% reduction in overall absences and a 40% reduction in unauthorised absences when regular school inspections were conducted (Muralidharan et al., 2017). In another case, financial incentives that required teachers in India to take time-stamped photos with their class at the beginning and end of the school day led to better teacher attendance and, consequently, improved learning outcomes (Mbiti, 2016). Such initiatives not only enhance student learning gains but also establish professional expectations that can positively influence future generations of teachers.

However, the issue of teacher shortages extends beyond absenteeism, particularly in regions with daunting student-teacher ratios, such as South Asia, the Middle East, and Africa, where these ratios range from 35:1 to 90:1 (World Bank, 2018). This imbalance often forces teachers to focus more on classroom management than instruction, detracting from student achievement (Molina et al., 2020). Yet, efforts to reduce class sizes by hiring more teachers do not always lead to better outcomes. In western Kenya, for example, increasing the number of teachers did not improve performance. Instead, the additional staff reduced teachers' sense of urgency and responsibility, leading to a diffusion of accountability and a shift in focus to personal priorities, such as securing jobs for relatives (Mbiti, 2016). This example highlights the need for regular teacher observation and constructive coaching to accompany staffing increases, ensuring that expanded capacity translates into better instructional quality.

To optimise student learning, it is crucial that teachers be adequately supported by their education systems, and this support should include relevant, consistent in-service training. However, this vital support for professional performance is often lacking (World Bank, 2018). According to UNESCO's 2017 data, between one-third and over half of Primary school teachers in 21 countries are not adequately trained, and the quality of training varies across these nations (Montoya, 2019). Additionally, many teachers face heavy workloads that include administrative tasks unrelated to instruction, as well as a shortage of teaching and learning materials. Professional development for non-teaching education personnel is also essential, enabling them to better manage school-wide responsibilities and provide coaching to teachers. The use of structured pedagogy can further alleviate the burden on teachers who lack the time or resources to design effective lesson plans. Through increased training and support, teachers can be better positioned to meet professional standards.

Effective policymaking starts with reliable data

The coordinated, effective action of all stakeholders in an education system is essential for fostering student success - and lack thereof can undermine that success. The latter is especially a risk when policymakers' decisions do not properly leverage all components of the education system towards achieving a clear objective of enhanced student learning. Yet, policymakers seeking to enact change for learning-deprived schools can be inhibited or misled by an absence of data. Without accurate information about the state of learning across their education systems, policymakers lack the context with which to make viable recommendations. This insufficiency of actionable data is most common in the parts of the world where such data are needed most. World Bank research has demonstrated that LMIC, which represent the majority of the global population, have historically lacked assessment results that reliably compare learning outcomes on an international scale - and it is these countries that have the most room for growth in terms of education quality (Angrist et al., 2021). Therefore, it is essential that the decision-making process for improving education quality begin with the system-wide collection of robust, regular measurements on the state of learning.

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Importantly, a single assessment or statistic does not paint the full picture; in order to accurately gauge the health of an education system, policymakers must have access to multiple cuts of data, and be equipped to consider data from multiple angles. For example, if students who struggled on one assessment withdrew from school in higher proportions than mid- to high-performing students, subsequent assessments would present a seemingly more favourable picture on average, even though learning levels will not in fact have improved (World Bank, 2018). Without additional data focusing on the participation and performance of these struggling students, policymakers would be misled - even when lack of measurement is not an issue.

Just as policymakers can benefit from reliable data on learning levels, education systems can benefit from fostering a culture of data usage at all levels. Teachers who regularly conduct formative assessments in the classroom will be able to identify students needing extra support, and provide differentiated instruction based on individual students' levels of preparation. School leaders and regional officials who access data from state or national assessments - and view breakdowns by classroom, school, or regional subdivision - will be able to identify teachers needing additional coaching and schools needing extra support. Nations participating in international large-scale assessments (ILSAs), which evaluate the effectiveness of education systems across countries and over time (World Bank, 2018; Rocher & Hastedt, 2020), will be able to gauge their own progress against that of their peers. The integrated information from these multiple layers of data sources will inform the broad reforms implemented by education leaders, which will in turn guide the day-to-day instruction in classrooms.



The case for solving the learning crisis through targeted investment in foundational skills and beyond

There is potential for substantial economic gains from thoughtful, increased investment in education

Students with strong learning outcomes are more likely to achieve higher educational attainment and are subsequently more productive and fulfilled in the labour market. For instance, research by the World Bank in 2018, based on observations in 139 countries, found a 9% average increase in wages for every additional year of schooling (Patrinos & Psacharopoulos, 2018). The converse also holds true; students currently deprived of learning stand to lose a collective \$10 trillion in potential labour earnings over their working lives, which will have broader detrimental effects on the economies where these former students live and work. These foregone earnings are equivalent to one-tenth of global GDP and are twice the global annual public expenditure on Primary and Secondary education (Azevedo, 2020). Moreover, comprehensive research shows that deficits in student performance could lead to a loss of \$700 trillion from the global economy by 2100 (Gust et al., 2022). The failure of education systems to meet the needs of the global population could lead to large financial losses, not only by impeding individual students' chances for personal prosperity but also by reducing potential future investments in education for subsequent generations.

Still, it should be recognised that the current amount of funding being devoted to education quality improvement is significant. On average, 14% of worldwide government expenditures are devoted to education, according to USAID (2018), and an average of USD 5 trillion is spent on education every year across the globe. A UNESCO report calls for an additional USD 500 billion of yearly education funding from low- and middle-income countries, specifically, to reach SDG 4 by 2030 (2022a). While these amounts pale in comparison to what is forecast to be lost if low learning levels and resultant high rates of school dropout continue, it is possible to achieve higher returns on these investments by ensuring that they are strategically allocated to reforms that have been proven effective in elevating student performance, which will in turn contribute to student retention. Therefore, concerted effort towards solving the learning crisis is the foremost proposed action to ensure the cost-effectiveness of education funding and increased opportunity for sustaining these investments over time.

Supporting cognitive development in childhood is crucial for ensuring a solid knowledge base in adulthood and enhancing pedagogy in classrooms

Missed learning opportunities early in life can have a stunting effect on students' learning trajectories as they advance through their education. Although the brain continues to adapt and foster learning throughout life, it operates most effectively when provided with a strong foundation during childhood upon which to build increasingly complex skills. In other words, students who lack mastery of fundamental content from the early grades are at greater risk of slower progress due to the cumulative nature of learning, which is particularly significant in a finite formal education period (World Bank, 2018; Eble & Escueta, 2022). The negative impact of early learning deficits is compounded by the fact that the synapses responsible for sensory pathways, language comprehension, and higher cognitive functions gradually plateau as children approach early adulthood. Therefore, a robust skills base is essential for pursuing an increasingly comprehensive education that adequately prepares graduates for societal participation (World Bank, 2018).

Further evidence supports the notion that foundational skills are pivotal for academic success. Observations conducted by researchers in high-performing classrooms reveal that foundational skills should be viewed as stepping stones to more advanced knowledge (Hwa & Duong, 2021). Mastery of fundamental concepts enables teachers to connect new ideas to previously learned material, moving beyond rote memorisation to more meaningful practice. This approach enhances students' ability to acquire and retain a broader scope of knowledge throughout their education. However, many curricula in LMIC still do not prioritise mastery of foundational literacy and numeracy, which ultimately hinders students' progress in subsequent stages of instruction.

Conversely, students who engage with and apply foundational skills are better equipped to develop metacognitive thinking from an early age. Those encouraged by their teachers to analyse their own learning processes tend to exhibit better performance and greater interest in learning (Hwa & Duong, 2021). Thus, fostering cognitive development through a learning-centric environment has cumulative benefits, enhancing both teaching practices and student agency. This, in turn, leads to more effective classrooms and improved educational outcomes.

Elevating education quality standards drastically improves educational equity

It is often the case, across LMIC, that students from relatively disadvantaged socioeconomic backgrounds display lower performance in foundational literacy and numeracy competencies, in addition to being less likely to remain in school for the duration of or following their Primary school careers. These disparities increase over time, which highlights the necessity of early interventions that create equitable learning opportunities and foster gains for students from all wealth groups (DHS, 2014, 2015; Spaul & Kotze, 2015). Research indicates that improving student mastery of foundational skills in an education system, regardless of the variety of socioeconomic backgrounds of the students comprising it, narrows gaps in academic performance – the very gaps that have been attributable to differences in student background – by providing the appropriate substructure students need before becoming exposed to more advanced concepts (Crouch et al., 2021; Asim, 2020). The implication of a narrowing learning divide, furthermore, is that a greater number of students become important contributors to a knowledge-based economy from which they otherwise would have been excluded.

Further evidence suggests that even in instances of severe socioeconomic disadvantage, students' demand-side characteristics are neither a determinant nor a deterrent of their level of educational achievement to the extent that the supply-side characteristic – the level of education quality – is. Put plainly, children who are motivated and supported by their households to learn still do not develop crucial foundational literacy and numeracy skills after years of schooling when education quality is poor, while the converse is not true – that is, a lack of fortifying inputs in the households of these children does not detract from their ability to learn at a sufficient pace and to a commendable degree when the quality of education available to them is improved (Eble & Escueta, 2022). In this sense, devoting education resources towards achievement of foundational skills raises performance standards for all students, and therefore promotes the upward mobility of all citizens in a society.

Education systems must be improved holistically

Optimising investments in education requires aligning entire education systems towards the common goal of enhancing learning in foundational skills and beyond. Education systems consist of many components – such as teachers, students, school infrastructure, and school leaders – and reform initiatives often target improving the quality or performance of individual components to mirror the characteristics of high-functioning education systems (Pritchett, 2013; Spivack, 2021). However, such approaches frequently overlook a crucial aspect: the interactions among these components. These relationships not only define but also reinforce the objectives of the entire education system (Spivack, 2021).

When the goals of one component are misaligned with the overall objectives of the system or when no clear objective is present, the quality of education and learning outcomes are compromised (Kaffenberger, 2021). It is not enough to adjust individual components; the processes through which they support or hinder each other must also be evaluated and refined to enhance their effectiveness in promoting meaningful learning.

In recent decades, global education systems have successfully focused on making schooling more accessible, thereby increasing enrolment and attendance (Spivack, 2021). To address the pressing need to improve student learning levels – essential for maintaining high enrolment and attainment rates and for enabling students to translate academic benefits into their future lives – education systems must be similarly aligned with comprehensive accountability and unified coherence. Therefore, any new intervention that countries may consider, particularly large investments, must ensure that all components, including both new and existing resources, work cohesively towards the ultimate goal of stronger learning outcomes that enable students to lead fulfilling and productive lives in the future.

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